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THE GLOBAL TRANSPORTATION NETWORK: THE HEART OF IN-TRANSIT VISIBILITY
by
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THE GLOBAL TRANSPORTATION NETWORK: THE HEART OF IN-TRANSIT VISIBILITY

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requirements for the degree of

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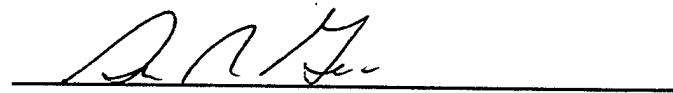
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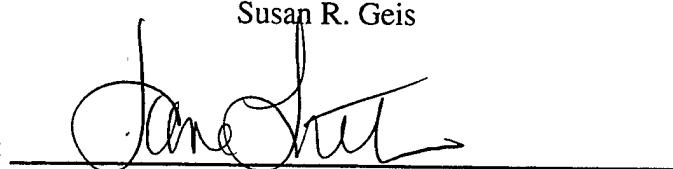
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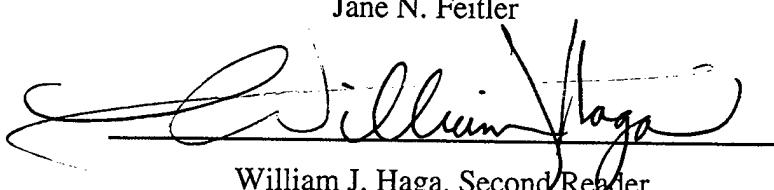
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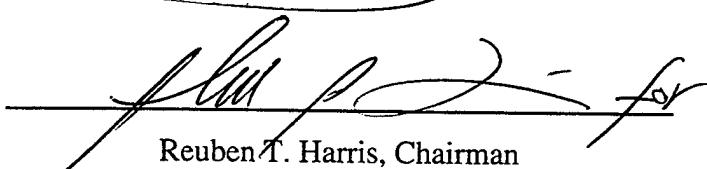
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ABSTRACT

The Persian Gulf War highlighted problems concerning in-transit visibility (ITV). The lack of in-tranit visibility resulted in over 20,000 of 40,000 containers entering the theater of operations being opened, inventoried, resealed, and shipped back into the transportation system because the troops did not know what the contents were. There was also a lack of ITV coverage over troop movements throughout area of operations. As a result of the Persian Gulf fiasco, the United States Transportation Command, was given the responsibility for designing and providing a DoD-wide ITV system using the Global Transportation Network (GTN). GTN is an integrated database system that provides users with real-time in-transit visibility information, and C2 capabilities to facilitate transportation planning and decision making. This thesis examines how well GTN is performing in the area of in-transit visibility since becoming operational in August of 1997, especially compared with commercial tracking systems. The results of this research will provide valuable insights into the actual in-transit visibility capabilities of the GTN system. It will also enable future and current transportation managers in DoD to become more aware of the ITV capabilities of GTN as well as commercial systems that can further improve the Global Transportation Network's capabilities.

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I.   INTRODUCTION

A.   PURPOSE

The purpose of this research is to analyze the Global Transportation Network's In-Transit Visibility capabilities and compare them to an existing commercial tracking system. This thesis examines how well the Global Transportation Network's in-transit visibility is progressing since becoming operational in August of 1997, especially compared with commercial transportation companies using in-transit visibility systems. It will also provide the reader with the basic knowledge of the various processes that encompass GTN's asset visibility capability, such as electronic data interchange (EDI), total asset visibility (TAV), sources of information, and tracking systems.

This chapter provides a brief history of the events leading up to the development of the Global Transportation Network. It also discusses the scope, method, and organization of the study.

B.   BACKGROUND

Defense transportation was originally managed individually by the three Services through their own Transportation Component Commands (TCCs); the Army's Military Traffic Management Command (MTMC), the Navy's Military Sealift Command (MSC), and the Air Force's Air Mobility Command (AMC). Although each Service was benefiting using their own Defense Transportation System (DTS), the system as a whole suffered. Users of DTS had to contend with conflicting information, policies and procedures, and had to go through multiple sources to coordinate movements. There were also communication and coordination problems between the three Services in

movement of cargo and passengers that were brought forth during joint exercises. (Smart, 1995)

For example, 150 independent automated systems were identified by the Joint Transportation Corporate Information Management Center (JTCC) as being used to support DTS functions. (Smart, 1995) Unfortunately, these systems were incapable of being coordinated and lacked the ability to share information. The implications of this were that transportation users and suppliers had to use more than one system to coordinate the movement of freight and passengers. Although during times of peace, these problems resulted in frustration and efficiency problems; during war, they can become crucial deficiency problems. (Smart, 1995)

The 1986 Blue Ribbon Commission on Defense Management was initiated due to the ongoing user problems and system inefficiencies generated by the three independent TCC's. (Smart, 1995) The Blue Ribbon Commission recommended that the DTS be managed by a single unified transportation command that integrated land, sea and air transportation. That same year, the Goldwater-Nichols DoD Reorganization Act was passed creating the United States Transportation Command (USTRANSCOM) as the single DTS manager. Although USTRANCOM was considered the manager of DTS, the Services still retained their Transportation Command Centers as their management tool for transporting their shipments and passengers. Consequently, this limited USTRANSCOM's ability to manage and control the DTS. (Smart, 1995) This lack of control over the TCCs and the inefficiency problems due to poor coordination and non-

existent in-transit visibility over cargo and troop movements was highlighted during the Persian Gulf War.

The Persian Gulf War highlighted the efficiencies, communications and coordination problems associated with not having a true single manager of DTS. During the Persian Gulf War, the lack of in-transit visibility resulted in over 20,000 of 40,000 containers entering the theater of operations being opened, inventoried, resealed, and shipped back into the transportation system because the troops did not know what the contents were. Additionally, approximately 60% of the patients being evacuated ended up at the wrong destination. There was also a lack of in-transit visibility over troop movements into, through, and out of the area of operations. (Defense Intransit..., 1995) Subsequently, on February 14, 1992, the Secretary of Defense created the United States Commander in Chief Transportation Command (USCINCTRANSCOM) as the sole manager of the Department of Defense Transportation System. Now, the three TCC's are assigned to USTRANSCOM through USCINCTRANSCOM during peace and war. (Smart, 1995)

USTRANSCOM, using the Global Transportation Network (GTN), has been given the responsibility for designing and providing a DoD-wide In-Transit Visibility (ITV) system. GTN is an integrated data base system that provides users with real-time in-transit visibility information, and command and control capabilities to facilitate transportation planning and decision making during all types of operations. (GTN Introduction & System Overview, Web Page, 1998)

C.   RESEARCH QUESTIONS

1.   Primary Research Questions:

How well is the Global Transportation Network performing in the area of In-Transit Visibility when compared with an existing commercial tracking system?

2.   Secondary Research Questions:

a.   What is the Global Transportation Network (GTN)?

b.   Why was GTN created?

c.   What does GTN actually do?

d.   What is In-Transit Visibility (ITV)?

e.   What is Total Asset Visibility (TAV)?

f.   What is In-Transit Visibility's relationship to TAV?

g.   What is Electronic Data Interchange (EDI)?

h.   How is EDI involved with ITV?

i.   What is the future of EDI in Defense Transportation?

j.   What is a typical GTN scenario?

D.   RESEARCH SCOPE AND METHOD

This research will analyze the performance of the Global Transportation Network's In-Transit Visibility capabilities since becoming operational in August 1997, and compare them to an existing commercial tracking system used by FedEx. To accomplish this analysis, the following resources were used:

1. Books, Periodicals, Journals, CD-ROM systems, electronic resources, and other library information.

2. Department of Defense Publications

3. Internet web-sites

4. Phone conversations

5. Electronic messaging (email)

6. Surveys

The next step was to analyze the Global Transportation Network as a "user" of the system by obtaining a user account and manual from USTRANSCOM. Once access was obtained, various features were tested and compared with Federal Express' (FedEx) commercial tracking system. In order to compare the two systems, requisitions were tracked using the Global Transportation Network, and a commercial shipment was tracked using FedEx's online tracking system.

E.   ORGANIZATION OF STUDY

Chapter II provides an introduction to in-transit visibility and total asset visibility. It also provides a basic understanding of electronic data interchange, and introduces the development of the Global Transportation Network. The chapter concludes with a summation of the key concepts and their relationship to each other.

Chapter III introduces the current capabilities of the Global Transportation Network. This chapter identifies the sources feeding into GTN and the tracking systems employed. Additionally, Chapter III discusses the basic flow of information from origin to destination, and identifies the predominant users of GTN. The chapter also discusses the various query options, and how to perform them within the GTN system according to the User Guide. Additionally, the chapter identifies commercial carriers that are enrolled in GTN which provide In-transit Information to the GTN system. Finally, the chapter

discusses the known quirks or problems facing GTN as well as looking at possible future GTN developments.

Chapter IV presents the "user's perspective" of using GTN. This chapter follows a new user actually employing the GTN system to track requisitions for a ship. The Chapter highlights the problems encountered with using GTN for the first time. This Chapter also compares the GTN system with FedEx's tracking system. Finally, it answers the question of whether or not GTN is known and being used in the Fleet.

Chapter V summarizes the findings of the research, and presents recommendations for further research and study.

F.   BENEFITS OF STUDY

The results of this research will provide valuable insights into the actual in-transit visibility capabilities of the Global Transportation Network since becoming operational in late 1997, especially when compared with its commercial counterparts. Specifically, the lessons learned from this study will enable future and current transportation managers in DoD to become more aware of the in-transit visibility capabilities of GTN as well as commercial applications that can further improve the Global Transportation Network's capabilities.

II.   LITERATURE REVIEW

A.   INTRODUCTION

Where's my part? When is it going to arrive? How's it going to being shipped? These are familiar questions faced by Supply Officers, Department Heads and Division Officers every day in the Fleet. In the era of force reductions and constant fiscal constraints, officers require updated information regarding their precious shipments, whether it be toilet paper or a circuit card for a fire control system. Officers that have visibility over their shipments will be able to prevent duplicate requisitions, save time and money, and divert shipments to new locations when the unit or ship relocates unexpectedly.

This chapter will provide an introduction to in-transit visibility and total asset visibility. It will also provide a basic understanding of electronic data interchange as well as introduce the development of the Global Transportation Network.

B.   IN-TRANSIT VISIBILITY (ITV)

The term "In-transit Visibility" was born in the "analysis of requisition order-ship-time". (Manzagol and Brown, 1996) ITV in this early stage was defined as the ability to track how long shipments were in the transportation pipeline. Currently, ITV is seen as watching shipments move throughout the transportation process by receiving "real-time" updated shipment status of cargo, personnel, personnel property, and medical evacuations as they are being transported. So where does this "real-time" information come from? Real-time information comes from Automated Identification Technologies (AIT) that include barcode labels, RF tags, and laser optical cards. (Manzagol and Brown, 1996)

A September 9, 1992 Deputy Assistant Secretary of Defense memorandum listed some of the capabilities of AIT:

1. To be able to identify the contents of containers, pallets, and consolidated shipments.

2. Using a single tag, be able to identify container content detail such as, resupply line item detail data.

3. Automatically enter data regarding container and pallet content information into unit and theater supply data bases.

4. Share information between government and commercial computer systems.

5. Allow global interoperability and technology certification.

6. Operate in a variety of locations, warehouses, surface ships, planes, terminals, land vehicles, and all equipment used in transporting shipments.

7. Operate in a variety of climates.

8. Operate close to munitions and hazardous material. (Defense Intransit..., 1995)

By using RF (radio frequency) encoded tags containing container and air pallet content information in conjunction with real-time updates received from a central ITV data base, troops will no longer have to search through containers or air pallets to see what the contents are. In-transit visibility is not a system but a capability. A capability made manifest through the USTRANSCOM's Global Transportation Network (GTN). (Manzagol and Brown, 1996) However, before discussing GTN, two important capabilities; total asset visibility and electronic data interchange, need to be discussed.

C.   TOTAL ASSET VISIBILITY (TAV)

Total Asset Visibility is comprised of in-transit, in-process and in-storage visibility. (Manzagol and Brown, 1996) Where ITV just looks at the shipment while in-

transit, TAV looks at the shipment before it ever leaves the warehouse. Total asset

visibility "sees" the entire logistics pipeline. A more comprehensive definition of TAV

as it relates to the Department of Defense (DoD) is:

> ...the ability to gather information from DoD systems on the identification,
> quantity, condition, location, movement, and status of material, units,
> personnel, equipment, and supplies anywhere in the logistics system at any
> time, and to apply information to improve logistics processes. DoD has
> expanded TAV to include all classes of supply, units, personnel, and
> medical patients. TAV provides an essential management tool to
> customers, item managers, weapon system managers, and commanders in
> chief (CINCs) to move and redirect materiel, to redistribute items, to view
> forces flowing into theaters, and to optimize overseas stock positioning.
> (Logistics, chap15.html, 27Aug98)

Total asset visibility usually involves technologies such as bar coding, RF tags, smart

response tags, GPS (global positioning system), transceivers, and satellite and fiber

command and control communication links. (Kaminski, 1996) For example, a TAV

process usually involves placing RF tags on containers, which are scanned with fixed or

hand-held interrogators (scanners) that allow users to automatically find their shipments

either in the warehouse or while they are being transported. ("Behind Every Cloud",

1995)

The Department of Defense's TAV program is called the Joint Total Asset

Visibility (JTAV) program. JTAV objectives mirror TAV objectives used by the

commercial sector; to provide the user with real-time information on the location, status,

movement, and identity of the items being moved, whether troops, equipment, or supplies

anywhere at any time. (Martling, 1997)

Total Asset Visibility is being used within the DoD to reduce the amount of "new" inventory. TAV gives managers the ability to see where, how much, and the condition of their assets, anywhere at anytime in the supply chain. This information is used to fill customer orders without having to buy new inventories. (Emahiser, 1997) JTAV has the added benefit of providing CINCs with *common* information regarding all DoD assets within the logistics pipeline. Additionally, JTAV has the ability to provide a "...complete picture of the provider-to-user pipeline, lower in-theater inventories of spares, smaller logistics footprint, and equal or better mission capable rates". (Logistics, 1998)

D.   ELECTRONIC DATA INTERCHANGE (EDI)

Electronic Data Interchange is the process of instantly sending messages and/or data electronically to business partners anywhere in the world. Uses of EDI include but are not limited to the following: generating purchasing orders, sending invoices and bills of lading, advance shipment notification, and shipment tracking. (Andel, 1997) There are two basic formatting standards used in EDI transactions. They are the American National Standards Institute X12 (ANSI X12) and the EDI for Administration, Commerce and Transportation (EDIFACT). These standards or common language formats allow different computer systems to communicate. Here in lies the problem. The standards are different for different industries. This especially becomes evident when business transactions are done globally with the two predominant standards being ANSI and EDIFACT. (Sutton, 1997)

The American National Standards Institute is the EDI standard within the United States, while EDI for Administration, Commerce and Transportation is the United Nations sponsored EDI format used in Europe. (Payne and Anderson, 1991) To enable global EDI transactions, integration software has been and continues to be developed predominately with the help of the International Transport Implementation Guidelines Group (ITIGG). ITIGG members have been and are currently in the process of developing and implementing the UN/EDIFACT EDI message standards in the transportation industry. ITIGG conducts meetings to resolve differences in message formats, and provides guidelines for software developers to assist them in designing EDI software that can be used globally. (ITIGG, Web Page, 1998) Additionally, a task force was initiated in 1995 to make both ANSI and EDIFACT compatible. The goal is to eliminate ANSI X12 formatting standards. (Sutton, 1997) Through the efforts of groups like ITIGG, the EDI task force and software developers, EDI standards are no longer the great barrier they once were in the late 1960s when EDI was first introduced. (Payne, 1991) However, where does the government fit in this picture?

The main impetus for EDI/EC (EC stands for electronic commerce) began with President Clinton's Executive Order 26, "The National Performance Review" of October 1993, and "Procurement Reform Legislation". (Sutton, 1997) "President Clinton's executive order directed full-scale implementation of the federal electronic commerce system by 1997....(Sutton, 1997)." And the "...procurement reform legislation provides incentive for government agencies to use EDI by raising the small-purchase threshold from $25,000 to $100,000 for EDI-based procurement transactions." (Sutton, 1997)

Through these actions, government business practices started to change. The federal government has since adopted ANSI X12 formatting standards to conduct business transactions using EDI. DoD chose to use Standard Exchange Format (SEF), which is based on ANSI X12 and EDIFACT formatting standards in order to conduct business with the commercial industry. (Sutton, 1997) Formatting standards are one consideration that must be considered when implementing EDI; another one is the way in which to communicate.

There are three basic ways in which to communicate using EDI: Value Added Networks, direct connects, and the Internet. A Value Added Network (VAN) " is a professional organization designed to provide what is essentially wide-area electronic mail." (Sutton, 1997) Direct connect is a dedicated, computer to computer system that allows companies to transmit information directly into each other's databases. (Sutton, 1997) Lastly, EDI-Internet based applications use the structure of EDI codes and changes them into Internet interfaces such as HTTP, HTML, TCP/IP, MIME, and FTP. (Puttre', 1997) There is also movement attempting to get VAN-type service onto a public network similar to an ISP (Internet Service Provider). The Internet-VANS will provide EDI transmissions via the Internet as an encrypted FTP (File Transfer Protocol) file.(Andel, 1997)

E.   **GLOBAL TRANSPORTATION NETWORK (GTN): THE BEGINNING**

As mentioned earlier in this chapter, USTRANSCOM, using the Global Transportation Network, has been given the responsibility for the designing and providing a DoD-wide In-transit Visibility system. The Global Transportation Network

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is the heart of USTRANSCOM's ITV; it is a database that collects and stores in-transit shipment information such as documentation, shipment status, booking information, manifests, and modal scheduling. (Defense Intransit...., 1995) GTN is an integrated database system that provides users with "real-time" in-transit visibility information and command and control capabilities to facilitate transportation planning and decision making during all types of operations. (GTN Introduction & Systems Overview, Web Page, 1998)

USTRANSCOM, to meet the complexities of integrating such a complex system, developed and implemented GTN in phases. The first phase began in 1989 when it implemented an ITV prototype to answer a limited number of ITV questions, namely location and status of shipments, containers, and passenger movements by using "real-time" ITV data from existing databases. (Defense Intransit...., 1995)

In 1990, GTN Version 1 was deployed. Version 1 differed from the prototype in two ways: first, it used leased telephone lines vice dial-up and second, it relied on a cache data base to save query information for one day. Both experienced problems. First, both systems were extremely communications-intensive because they relied on "pulling data from participating systems". (Defense Intransit...., 1995) Second, they did not retain the results from their individual queries. GTN Version 2 was developed to solve the problems raised by the prototype and Version 1. Version 2 used "the participating systems to 'push' information to a centralized data base as part of their normal protocols and processing workloads." (Defense Intransit.... 1995) This way of operation allows the

system to support a larger customer database without over taxing the "interactive-user-load" on the remaining supporting systems. (Defense Intransit...., 1995)

The second prototype of GTN, Version 2.1, was tested by USTRANSCOM in 1993. Version 2.1 emphasized tracking air shipments (cargo and passengers) from the Point of Embarkation (POE) to the Point of Debarkation (POD). This version used "MILSTRIP as transactions received from" the Defense Automated Addressing System (DAAS) "to link the requisition number; national stock number (NSN); and transportation control number (TCN). The TCN is then linked to Advance Transportation Control and Movement Document (ATCMD) data received from AMC port activities using the Headquarters On-line System for Transportation (HOST) network of systems". (Defense Intransit...., 1995) From the passenger side of the house, GTN received the names of the passengers and their social security numbers from the Passenger Reservation and Manifesting System (PRAMS) which was AMC's passenger reservation system. AMC's Global Decision Support System (GDSS) provided information concerning the aircraft scheduling. (Defense Intransit...., 1995)

In 1994, GTN Version 2.2 was tested with similar capabilities as Version 2.1, but was used with surface shipments. As with Version 2.1, the requisition number, NSN, and TCN information were provided by DAAS. The transportation control movement document (TCMD), booking information, and other shipment information concerning cargo shipments that were transported between the POE and the POD were provided by MTMC's Worldwide Port System (WPS), Terminal Management System (TERMS), and Military Export Traffic System (METS II). (Defense Intransit...., 1995)

GTN Version 2.3 only employed ITV capability between the POE and the POD, but had improved GDSS interface for improved visibility of air missions. It also had a larger query base for air and surface operations. In addition, Version 2.3 provided the legwork for enlarging ITV capabilities to include CONUS and theater movements of cargo, passengers, and patients. (Defense Intransit....., 1995)

In August of 1997, the Intransit Visibility capability of GTN became operational. By December 1997, the Global Transportation Network had a huge data warehouse comprising over 43 gigabytes of information. At that time, GTN had the capability of posting approximately 80 percent of the information received within 5 minutes of receipt and replicated within seconds. (Martling, 1997)

F. CHAPTER SUMMARY

In-transit visibility is the capability to track the identity, status, and location of DoD assets, such as cargo, units, personnel, and personal property from origin to destination during peace or times of hostility. However, ITV is just once piece of "asset visibility". To get the complete picture of where the assets are, whether in transit or sitting in a warehouse, managers must have Total Asset Visibility capability.

Where ITV sees the actual movement of shipments, Total Asset Visibility sees the entire supply chain. TAV is the capability of getting real-time status and location of DoD assets anywhere in the logistics pipeline, normally through the use of RF tags, transceivers and satellite tracking systmems (GPS tracking systems). DoD's Joint Total Asset Visibility mirrors the same capability as TAV, but with the added benefit of providing CINCs with common knowledge encompassing the status of shipments,

personnel, cargo, supplies, and medical evacuations of all the Service's combined. EDI will provide the medium in which information is transmitted.

Electronic Data Interchange is the process of sending data between companies from one company's computer to another, without human intervention using a common format. "The basic concept of EDI...is that once data is entered into a computer system, that data should never have to be key-entered again. (Harmon, 1994)" EDI will provide the medium for moving ITV and TAV information to the Global Transportation Network. (GTN – Global Transportation Network, Web Site, 1998)

Global Transportation Network, specifically the ITV module of GTN, is the heart of DoD's In-Transit Visibility concept. The ITV module of GTN is a comprehensive data base of in-transit shipment information including, but not limited to, the following: bills of lading (government, military and commercial), vender documentation, status of shipments, booking information, passenger reservation and manifests, medical patient movements, and scheduling information for aircraft and ships. (Defense Intransit... 1995) According to General Kross, GTN is the "capstone of DTS command and control and Intransit Visibility (ITV) capability. (Martling, 1997)"

III. CURRENT STATUS OF GTN

A. INTRODUCTION

The basic idea of GTN's operating concept is that GTN will be a central ITV data base for all DoD unit and non-unit cargo and personnel moving from origin to destination. As such, the ITV module of GTN will need to receive source information from many different systems including commercial carriers. The information sources will provide ITV information that the GTN system uses to provide "real-time" feedback on shipment status to its customers.

B. SOURCES OF INFORMATION

GTN currently receives ITV information from eighteen sources or systems, and that number is expected to grow to 28, with an addition of ten new systems. (GTN Information Feeds, Web Page, 1998) Appendix A contains a comprehensive listing of current and future GTN sources of information. GTN compiles the information received from each system and takes the most current and best information provided to create a single source system for customers to access ITV information regarding their shipment status. (GTN Information Feeds, Web Page, 1998)

To facilitate the tracking of cargo and personnel movement, the Services have developed their own automatic tracking systems. The automated systems are: the Army Transportation Coordinator - Automated Command and Control Information System (TCACCIS); the Air Force, Cargo Movement Operating System (CMOS); and the Marine Corps, Transportation Coordinator's - Automated Information for Movements Systems (Marine Corps) (TC-AIMS (MC)). (Defense Instransit...., 1995 and GTN

Information Feeds, Web Page, 1998) These systems make up the Transportation

Coordinator's-Automated Information for Movements System II (TC-AIMS II)--formally

known as TC-AIMS. (Defense Intransit...., 1995 and GTN Information Feeds, accessed

1998) For a pictorial representation of the GTN system interfaces, see Figure 1 below.
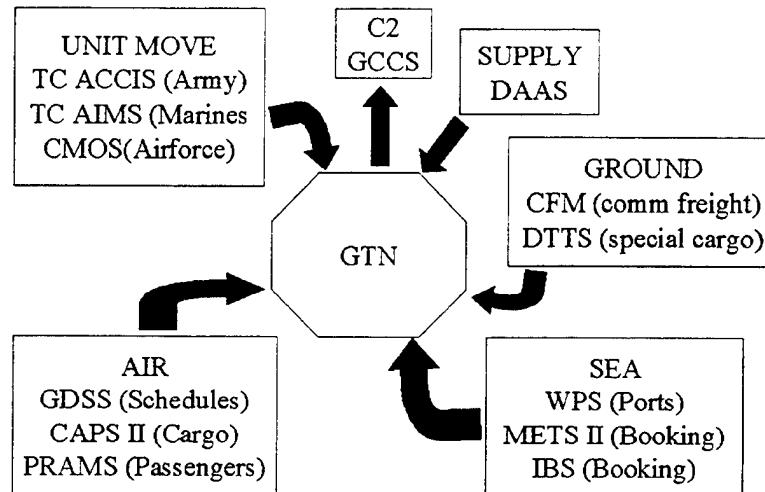
Figure 1. Information Systems (GTN User Course, Web Page)

For the purpose of this thesis, the systems listed below (with a brief description of

each) are important sources of ITV information used by the Global Transportation

Network. (NOTE: see Appendix A for a more detailed definition of each system)

1. Cargo Movement Operations System (CMOS): An unclassified Air Force system that provides the capability of planning, documenting and coordinating both inbound and outbound cargo, manifests for airlift, truck and passengers, pallets, and hazardous material. (GTN Information Feeds, Web Page, 1998)

2. Consolidated Aerial Port System II (CAPS II): Provides unclassified cargo and passenger movement status automatically to HOST (Headquarters On-Line System for Transportation) and PRAMS (Passenger Reservation and

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Manifesting System). (GTN Information Feeds, accessed 1998) HOST provides information regarding cargo manifested, lifted, enroute, and located at AMC's airports. PRAMS supplies information on passenger movements on AMC flights. (Smart, 1995)

3. Defense Automated Addressing System (DAAS): Is an unclassified Defense Logistics Agency system that automatically routes and processes Military Standard Requisition and Issue Procedures (MILSTRIP) transactions. DAAS provides GTN with requisition and shipment status to it's customers--depots, shipping activities, and suppliers. (GTN Information Feeds, accessed 1998) It is interesting to note that not all requisitions go through DAAS. (GTN Information Feeds, accessed 1998) "The user can see what is requisitioned, what is in the pipeline, and what has been delivered (GTN Information Feeds, Web Page, 1998)".

4. Defense Transportation Tracking System (DTTS): The Naval Supply Systems Command/Navy Material Transportation Office operates this system. It provides DoD with unclassified near "real-time" movement status of Class I- IV explosive shipments being transported within CONUS either by train or truck. (GTN Information Feeds, Web Page, 1998)

5. World Wide Port System (WPS): An unclassified system operated by MTMC which provides information regarding cargo arriving, departing and located at CONUS and OCUNUS water ports. This system is used to manage inport and export DoD cargo located at water ports. (GTN Information Feeds, Web Page, 1998)

The Global Transportation Network will be able to support USTRANSCOM's customers by allowing them to identify the contents, and track and monitor their shipment's movement throughout the transportation system. GTN will be able to track cargo by using the Transportation Control Number (TCN), Unit Line Number (ULN), National Stock Number (NSN) or requisition number. GTN will also have the capability to track military cargo, for each of the Services, being transported by commercial carriers resulting from DoD purchase orders. (Smart, 1995)

C. GTN OPERATIONAL CONCEPT

GTN will collect the transportation information from the eighteen sources and pool it into an integrated data base to provide ITV, Command and Control (C2), and "business operations applications and information" to support the National Command Authorities (NCA), CINCs, military services, and other DoD customers. Please see Figure 2 below.
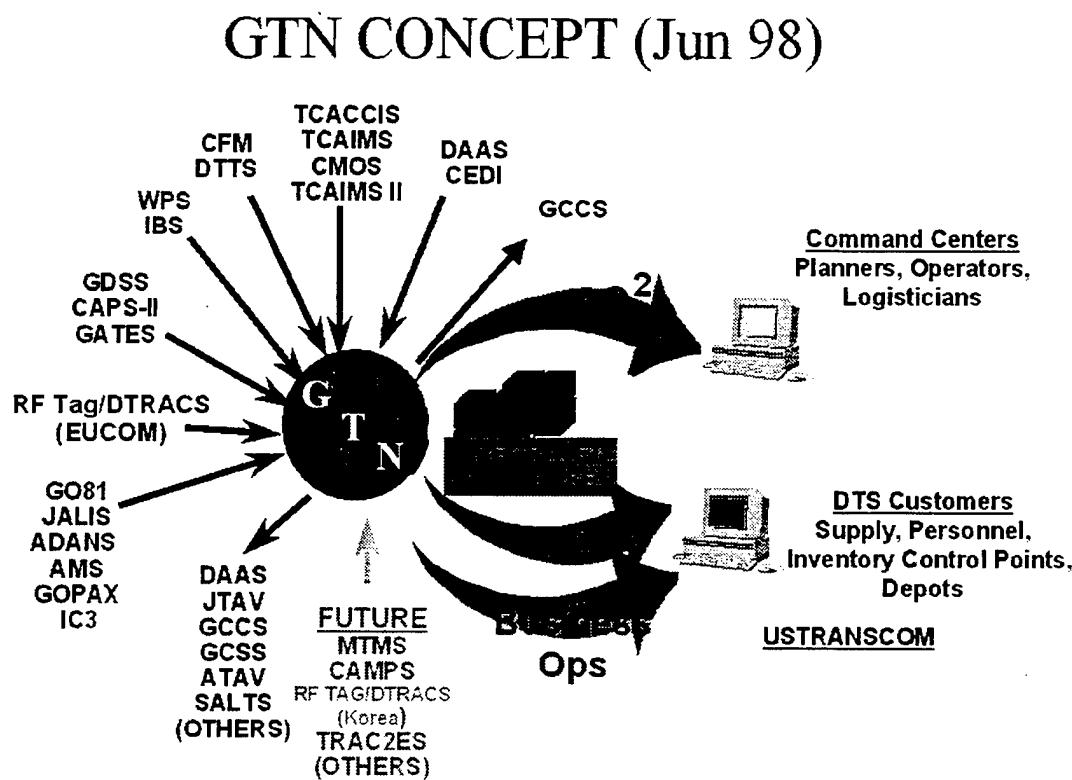
Figure 2. GTN Concept (GTN Web Page, 1998)

D.   GTN USERS

Who uses GTN? Anybody with a need for ITV information regarding DoD shipments can be considered a GTN customer. (GTN FAQ web page, accessed 1998) There are essentially three groups of users. The primary group is the Crisis Action Team (CAT) of USTRANSCOM's command center. There are approximately 100 users in this category that need the C2 information during hostilities. The second group is made up of approximately 400 operation and planning staff members who need GTN's C2 and ITV capabilities. The third group consists of approximately 4500 logistics support personnel throughout DoD who will use the ITV capability of GTN. (Smart, 1995)
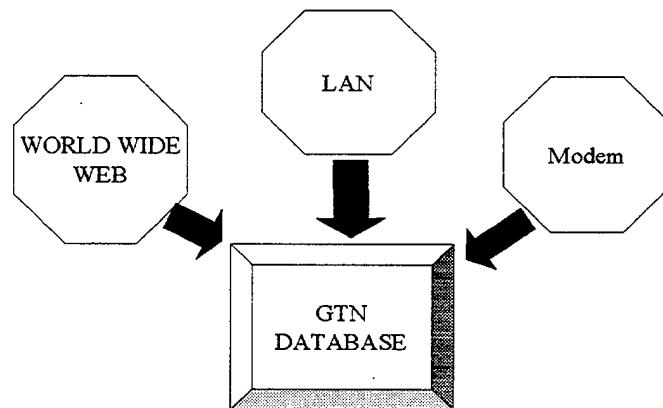
Figure 3. GTN User Access (GTN User Course Web Page)

GTN users will be able to connect to the system through several means:

1. Local Area Network (LAN)

2. Wide Area Network (WAN) which includes the Military Network (MILNET) and the Defense Information Systems Network (DISN)

3. Satellite - using the International Maritime Satellite (INMARSAT),

4. Remote user dial-in with a modem and terminal through the Defense Switched Network (DSN) or commercial phone lines. (Smart, 1995)

Currently, the GTN system is predominantly a World Wide Web based system which, relies extensively on the current capabilities of the Internet. (Tooker, PHONCON, 1998)

In order to access the GTN system, a user account, USERID, and a User Password must first be obtained from the System Administrator at TRANSCOM. (GTN Introduction & System Overview, Web Page, 1998) The process begins by submitting a request in writing to the System Administrator either by mail or fax. Appendix C contains a sample letter for requesting a GTN account, which can be found on the GTN home web page. The user should receive their account information in approximately two weeks. (GTN TCJP-LPD, Web Page, 1998) According to the GTN account web page, if access is needed sooner, one should call the Site Administrator on a STU-III (secure phone) two days after the account request was submitted and the USERID and password will be given over the STU-III. (GTN TCJP-LPD, Web Page, 1998) However, account access can be acquired even faster by faxing the Command Letterhead to the Site Administrator, and obtaining the User ID and password over the STU-III.

E.   OBTAINING INFORMATION

Once the account has been established, the user can begin gathering information from the system by using simple Queries. (GTN Users' Course, Web Page, 1998) For

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example, by going to the Cargo Query page, a menu is displayed with eight query search

options for "by the number searches". The user can select the mode of transportation for

the cargo and then tailor the search on the remaining query windows. Figure 4 shows a

typical GTN cargo query menu found on the GTN Cargo Query Web Page.

Figure 4. Cargo Query Menu (GTN Cargo Query, Web Page)

Query lines or "Blocks" 2 through 6 have multiple options or "picklists" within each

window that allow the user to further tailor their search/question. For example, clicking

on the arrow to the right of the first query window box using the mouse will bring up

several different search options in addition to the TCN already displayed, such as

Manufacturing Part Number, NSN, Requisition Number, RF Tag ID, and Transponder

ID. (GTN Cargo Query, Web Page, 1998)

The system also allows searches using "wildcards" or "substrings search". Substring searches are used when the user needs to locate many cargoes that have similar segments of a number or name. These "substrings" or "wildcards" are represented by a certain character or number that represent something such as TCNs. Depending upon which character is used, more or less information will be displayed. The wildcards used by GTN are the (?), percent sign (%), underscore (_), and asterisk (*). (GTN Help Page, Web Page, 1998) The question mark and underscore wildcards are considered a single character wildcard. These wildcards should be used when the user knows all but one digit in the requisition number, NSN, TCN, etc. Basically, the question mark or underscore wildcard replaces the unknown digit and allows GTN to bring back all requisitions containing the other digits of the requisition number, TCN, NSN, etc. while ignoring the digit where the wildcard was placed. The other two types of wildcards, the percent sign and asterisk, are variable length wildcards (GTN E-Web Primer, Web Page, 1999). These wildcards when used tell GTN to ignore "…anything before or after the wildcard character". (GTN E-Web Primer, Web Page, 1999)

Additionally, the wildcards can be used in any combination within the same strings, which can be beneficial if searching for many things with little information. Although queries done with wildcards tend to be slower than normal queries, lasting from minutes to hours, the system supports multiple queries, so the user does not have to wait for one query to finish before beginning a new one. (GTN Help Page, Web Page, 1998) In this author's experience, wildcard queries tend to take anywhere from 10 seconds to an hour, maybe more, depending whether or not the GTN system "kills" the query if it's

taking too long. Another helpful technique is to use the system's default mode; i.e., using

the page that automatically loads up when you first enter the site. For example, Figure 5

is the default window for the Cargo Query page. Using the default page, the user can

enter the TCN, NSN, RN, RF Tag ID, or Transponder ID in Block 2, and then press

submit in Block 8, and GTN will automatically provide the current shipment status

regardless of the transportation mode or location. (GTN Help Page, Web Page, 1998) A

successful search query will only take GTN approximately 5 seconds to generate

shipment status information.

Cargo Query is just one method of searching for shipment status. GTN has other

query pages (see Appendix D to view the other query menus) to facilitate users in

locating and finding out the current status of their shipments. The list below discusses

the other GTN query pages:

1. Passenger Query Page. This is the main query page in locating people while
   in-transit. As with the Cargo Query page, the search uses the same "by the
   numbers" approach using blocks with picklists. This page also allows
   wildcard searches. (GTN Help Page, Web Page, 1998)

2. Schedule Query Page. This is the principal query page for finding Air/Ocean
   Lift Missions. This page uses "by the number" search with picklists, and
   supports wildcard searches. (GTN Help Page, Web Page, 1998)

3. Unit Move Query Page. This query page, formally called the Forces Page,
   allows users to locate units in the field. It also uses search "by the number"
   with picklists and supports searches with wildcards. (GTN Help Page, Web
   Page, 1998)

4. Reference Page. This site is unique, in that it allows users to locate the codes
   used by transportation and supply specialists even when the codes are
   unrelated to each other. Like the previous query pages, this site allows for
   wildcard searches but does not use "by the number" searches. Instead, tables
   are used (similar to the tables used in "by the number" searches) that contain
   several columns with each having their own picklist. In addition, this page

uses a unique feature of multiple windows that the GTN Help Page calls "tres cool". This feature allows the user to locate several items that may or may not be related to each other but are in different domains by setting up a search in each domain simultaneously. (GTN Help Page, Web Page, 1998)

5. Requisition Query Page. This page resembles the Cargo Query Page in that it allows for searches using TCNs, Manufacturer Part Numbers, NSNs as well as Requisition Numbers and Item Name. And like the Cargo Query Page, the search can be qualified using Ownership Code, Project Code, Rail Car Number or nothing, but also contains the additional qualifiers of Required Delivery Date and Requisition Status. Wildcard searches and "by the numbers" navigation are supported. (GTN Help Page, Web Page, 1998)

6. Asset Query Page. Allows users to find assets in the GTN system traveling by air. (GTN Home Page, Web Page, 1998)

If the user is unfamiliar with conducting queries or the site in general, he/she can go to the online Help Pages.

The Help Pages provide an overview of the entire GTN site as well giving descriptions of query pages, account processing, operating characteristics and future releases. (GTN Help Page, Web Page, 1998) The Help Pages are extremely useful in understanding how the query pages work as well as the type of information available in each query page and their picklists. By using the Help Page, time was saved from having to log on to the site and to sift through multiple query page windows and picklists just to see what was available. Using the Help Page as a search medium can help a user find the best area to begin their search, without having to waste time searching the GTN Web site. If there are any problems encountered during the search or if the user would like to voice their opinion about the site in general, a Feedback Page has been established.

The Feedback Page can be used to report bugs in the system, to offer suggestions, give praise, or to provide constructive criticism. The author while conducting research

for this thesis was able to test the Feedback Page. The author had to submit a feedback

message when she was unable to log onto the system submitted. A response was

received the next day. Unfortunately, this problem could not be solved over the Internet.

However, it took only one phone call to the Site Administrator who was able to fix the

problem within a few minutes.

F.   SYSTEM QUIRKS AND HELPFUL INFORMATION

This section describes known quirks still being encountered in November 1998.

1. The main user interface for accessing the GTN system is through the Internet via the World Wide Web. In order to view the site's web pages, Netscape 3.0 Browser or later version of Netscape is required. Microsoft Internet Explorer will not work at the site because the site uses some Java script extensions that are not yet supported by the Explorer's browser. (GTN Help Page, Web Page, 1998)

2. Using Netscape 3.0 with Windows 3.1.1 will cause the browser to crash if "...too many rows with "hrefs" are brought back". These "hrefs"or hyperlink references use memory, and the more "hrefs" generated by a query output, the less rows the user will be able to return. (GTN Help Page, web page, 1998) (GTN Help Page, Web Page, 1998).

3. The user should be aware that when printing an output, each frame will have to be printed separately because the browser's print function will only print where the cursor has context. Also, due to some of the output pages being wider than the viewable screen, it may be necessary to change the printer setup to print in "landscape" and reduce the image from 100 percent down to a size that will allow the information to be within the viewable screen. (GTN Help Page, Web Page, 1998)

4. When going back and forth between queries, specifically between the query page and the output page, do not use the typical browser navigational buttons ("back" or "forward" buttons located at the top of the browser window) because a new browser window will open for the output page. The query page will remain "active" when viewing the output page; it's just "behind" the output page. All that is necessary to view the query page is to minimize the output page, and the query page will become visible once again. This process allows the user to conduct multiple queries simultaneously. (GTN Help Page, Web Page, 1998)

5. Every time prior to the output page being displayed, Netscape's browser pops up a security window warning the user of security issues. The popup window gives the user a choice of turning the warning feature off or keeping it on. The GTN Help Page recommends turning the warning feature off to ensure that the output page will load automatically in front of the query page. (GTN Help Page, Web Page, 1998)

6. There have also been problems encountered when scrolling too fast in the reference table's picklists. If the user scrolls too fast, either up or down, a general protection fault may occur. (GTN Help Page, Web Page, 1998)

G. COMMERCIAL CARRIERS

Having access to information in GTN concerning cargo and materials being transported by commercial carriers is considered vital for filling the gap in the ITV needs required to support all DoD contingencies. (Martling, 1997) The goal, according to Chet Martling, GTN Program Director, Lockhead Martin/Command & Control Integration Systems, was to put 20 commercial carriers into the GTN system by June 1998. Data transmission is by EDI. (Martling, 1997) As of November 1998, there were 22 Commercial Carriers enrolled in GTN. In alphabetical order they are:

1. ABF Freight Systems
2. American President Lines
3. Burlington Air Express
4. Cl Whitten
5. Con-Way Western Express
6. CSX Transportation
7. Diablo Transportation, Inc.
8. Emery Worldwide
9. FedEx
10. Green Valley Transportation Inc.
11. J.B. Hunt
12. Landstar Ranger
13. Lykes Line Limited
14. Nations Way Transport Service, Inc.
15. Old Dominion Freight Line

16. Overnite Transportation
17. Roadway Express
18. Sea Land Services
19. Trism Specialized Carrriers
20. Tri-State Motor Transit Company
21. Union Pacific RR
22. Yellow Freight System (GTN: Commercial Carriers, 1998)

These "Commerical Partners" not only move cargo and material for the DoD but also provide GTN with the necessary ITV information for its customers to locate their shipments within the commercial pipeline. (GTN Commercial Carriers, Web Page, 1998)

H.   GTN FUTURE DEVELOPMENTS

Currently, training to use the GTN system is taught at Scott Air Force Base in Illinois. However, with the constant changes in technology, training will be augmented and perhaps replaced via a training web page available from the GTN system. (GTN What's New, Web Page, 1998) The page will have updates on "what's new" as well as training documents that can be viewed online or printed. There is also a plan to develop online interactive tutorials and have them ready for use and made available through the GTN system by March 1999. These tutorials will be constantly updated to allow the GTN user to remain current on the capabilities of the GTN system. (GTN What's New, Web Page, 1998)

> In addition, the GTN customer outreach program will provide customer assistance visits and over-the-shoulder mentoring sessions to acquaint users with the current capabilities of the GTN system and tailor assistance to specific user audience and operational situation....(GTN What's New, Web Page, 1998).

I.   CHAPTER SUMMARY

GTN provides the user/customer with the ability to see in great detail, in a "real-time basis", what is in the logistic pipeline, whether cargo or passengers. This allows the

user to make faster transportation decisions based on current data. Additionally, GTN gives an edge in answering, correctly, Commanding Officer's questions regarding vital shipment status. (GTN Introduction & System Overview, Web Page, 1998)

The GTN system collects source information automatically from a variety of systems, both military and commercial. The information that is collected is integrated and fed into a centralized data base, and is then distributed to the user or customer. (GTN Introduction & Overview, Web Page, 1998)

The query pages are easy to use, normally facilitated by using the system's "by-the-numbers" navigation feature. Depending upon what the user needs to locate will dictate which query page to use to conduct their search. (GTN Help Page, Web Page, 1998)

The system however, is not without some quirks or problems, which the site maintainers are well aware of and are trying to resolve them. Despite the small quirks, the system provides a wealth of information on shipment status to the user right at their finger tips.

IV.   GTN: A USER'S PERSPECTIVE

A.   INTRODUCTION

One of the missions of the Global Transportation Network is to provide real-time In-Transit Visibility information regarding DoD shipments. (GTN Introduction & Overview, Web Page, 1998) Chapter III provided a general overview of the GTN system as well as provided a foundation for conducting system queries. Chapter III was the "book" or written version of how GTN is suppose to work, but *how well* does it *actually* perform based upon the user's perspective is the focal point of this chapter.

B.   METHODOLOGY: GTN INTERFACE

For the purpose of this thesis, only two query menus were tested, the Requisition query and Cargo query menus. In order to test the In-Transit Visibility capability of GTN, and see how well GTN provides shipment status, requisitions were requested from the USS CARRs' (FFG 52) Supply Officer (SUPPO). The USS CARR's SUPPO provided four requisitions:

1. Fire Pump Motor (V21233-8337-W059)

2. Shaft, Blower (V21233-8340-W060)

3. Cable (V21233-8348-W067)

4. Relay (V21233-8352-W070)

Once the requisitions were received, shipment status queries were conducted using GTN's query menus.

The following discussion will use the USS CARR's fire pump motor to illustrate the search method used in attempting to get shipment status. To begin the search,

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"Requisitions" was selected from the options available on the GTN homepage (see

Appendix E). This action brought the user to the Requisition Query Menu web page,

Figure 5 below.

Figure 5. GTN Requisition Query Menu (GTN Requisition Menu, Web Page)

The default setting, AnyMode, was used for Block 1. In Block #2, "Requisition #" was

selected from the four choices available (Requisition #, National Stock #, Manufacture

Part #, and Item Name) in the Block #2's picklist, and CARR's fire pump requisition

number, V2133-8337-W059, was typed into the blank text box provided. The search

variable selected under Block #3's picklist was "Requisition Status" and the box next to

help qualify the search was left blank. By selecting "Requisition Status" in Block #3, the

default variable in Block #4's picklist was automatically set to read "On Hand". It is

interesting to note that the variable "On Hand" could not be changed if "Requisition Status" was used in Block #3. However, if for example, "None" was selected in lieu of "Requisition Status", then the user had the option of picking from eight variables provided in Block #4's picklist—no default setting was initiated. The only time the user is forced to use a particular option under Block #4 occurs when "Requisition Status" in picked. Block #5 was left at the default setting, "Worldwide" and the "channel" text boxes were left blank. The dates or time frames contained in Block #6 were arbitrarily set to read January 1, 1999 to January 8, 1999. Block #7 was left at the default setting, "List answers grouped by location". And finally, the "Submit" button was used to activate the search. It took approximately 10 seconds for GTN to open a new browser window containing the search results. In this case, the GTN search generated a response of "No Data", and consequently, no shipment status was obtained.

Another query was generated using different options available in Requisition Query Menu Block's picklists – still using the CARR's fire pump requisition number to test the system. The default setting for Block #1 was still used as well as the "Requisition #" variable in Block #2's with the fire pump motor's requisition number going in the blank text box. However, "None" was selected for Block #3 and "Last Known Status" was used for Block #4. Blocks #5 through #8 were used the same as before. Block #6 was left alone because according to the new GTN E-Web Primer page, when "Last Known Status" queries are used in Block #4, Option #6 defaults to search all dates through the current date. (GTN E-Web Primer, Web Page, 1999) Once again it took

GTN only 10 seconds to respond to the query, and like the first search query, generated a response of "No Data".

A new query search was conducted for the CARR's Blower Shaft, V2133-8340-W060. The same process was used in this search as was used for the CARR's fire pump motor. And like the fire pump motor, the same search result was received, "No Data". The search process was repeated using the remainder of the requisition numbers provided by the USS CARR. All search queries generated the same response of "No Data".

Not giving up, further searches, were conducted using the Cargo Query Menu. The new searches generated the familiar "No Data" response. One final search was conducted once again using the Requisition Query Menu. Block #1's default setting was still used, but under Block #2, "Item Name" was selected from the picklist and "Fire Pump Motor" was typed in the blank text box instead of the requisition number. "Requisition Status" was then selected from the picklist in Block #3 with the text box left blank. And "Last Known Status" was chosen for Block #4. Block #5 through #8 were used the same way as they were used in the first search query. As before, GTN opened a new browser window but this time a status bar located at the bottom of the new browser window indicated that GTN was generating or downloading data resulting from the query. (Note: the status bar is the same "status" indicator that is used with any browser window to show that a page is being uploaded--there was nothing unique about it.) There was also another status bar located in the upper middle portion of the window which, moved back and forth, similar to the Netscape Logo blinking or rotating in the upper right hand corner of the browser window, indicating that GTN was still loading the search

results. After three hours of downloading, the system ceased working which, resulted in the search having to be aborted. At this point help was sought from USTRANSCOM.

A feedback form was drafted and sent to USTRANSCOM via the Feedback Page located at the GTN web site. A response was never received. However, the newly created GTN E-Web Primer page (part of the GTN training web page) listed a new e-mail link for the GTN Help Desk (helpdesk@gtn.safb.af.mil) that was used to send an e-mail explaining the problems encountered. (GTN E-Web Primer, Web Page, 1999) Two hours later a response came via commercial phone call. The GTN help representative queried the GTN system prior to making the phone call to see whether or not the requisitions were in the GTN system. She then ran the queries herself and found, with the exception of one, that they were in the system.

According to the GTN Help Desk representative, it is better to use simple or generic query inputs vice specific inputs. (Dowling, PHONCON, 1999) Therefore, the best way to conduct a query for the CARR's requisitions were to:

1. Block #1: "AnyMode".

2. Block #2: use "Requisition #" from the picklist. Place the requisition number in the text box provided, but leave off the last three digits and do not hyphenate between numerical sets. For example, requisition V21233-8337--W059 was inputted as V212338337W (note: system is not case sensitive).

3. Block #3: select "NONE" and leave the text box blank

4. Block #4: select "Last Known Status

5. Block #5: use default as "Worldwide"

6. Block #6: does not have to be set due to Option #4 having been set to "Last Known Status". The system will automatically provide the status through and up to the current date.

Following the representative's guidelines, an independent query was conducted on 15

January 1999 using the USS CARR's Fire Pump Motor. And this time, GTN provided

the status for the fire pump. The user has the option once the page has been loaded to

view it and save it as an Excel document. The following provides a list of some of the

information received by the GTN system after a successful query (Note: fields that

contain hyperlinks or html links, allow the user to obtain additional information regarding

the particular hyperlink, for example designator meaning):

1. RIC: Routing Identification Code field. In this case it was NBZ. If the user does not know what "NBZ" stands for, he or she can find out by simply clicking on "NBZ" due to it being a "hyperlink (html link). The user is alerted that the field is a "hyperlink" because the code or item is highlighted and underlined. By clicking on the "NBZ", more information is displayed about that particular field. In this example, "NBZ" turned out to be "Fleet Industrial Supply Center Jacksonville, Fl.".

2. SVC (Service): This field (hyperlink) displays a "letter" indicating the Service of the requisition. For this example was "N" which, stood for "Navy".

3. Mode: Method of transportation (hyperlink).

4. Shipper: Displays the shipper's code, which is a hyperlink For the fire pump, the code was SW3122, which stood for Defense District Depot, Jacksonville Florida.

5. Ship To: A hyperlink field indicating the item's final destination. In this case was "V2133", the USS CARR's (FFG 52) designator.

6. Status: Displays the status of the requisition. For the fire pump the status was "onhand".

7. Cdn: Cordination of Shipment (hyperlink). For the fire pump, the code was "REC" (hyperlink) which, stood for "receipted". For the CARR's relay it was "SXD" which, stood for "scheduled to depart DAAS".

8. As of: Hyperlink showing the time of the requisition. By clicking on the time, a reference location page for the item is opened (see Appendix F).

9. Date: Date (hyperlink) of the requisition status in Julian Date format. If the user clicks on the hyperlink, another page is loaded displaying the date in the traditional calendar date format. For example, the fire pump the date was 8364 which, stood for December 30, 1998.

10. TCN: displays the Transportation Control Number (hyperlink).

11. POE: gives the item's Point of Embarkation. For the fire pump, the POE was "SIZ" (hyperlink) which, stood for Sigonella NAS in Sicily.

Queries were conducted for the rest of CARR's requisitions, and status was found on all but one requisition (V21233-8348-W067, Cable). Additionally, because the queries were "generic", other requisitions that were ordered on the same Julian Day, were also displayed (five additional requisitions). It took GTN approximately 5 to 7 seconds to generate status information for each of the nine requisitions. Another interesting finding pertains to the fact that this quirk in conducting requisition queries encountered during the initial queries is not consistent. On January 27, 1999 a requisition query was conducted once again for the CARR's fire pump motor, only this time the entire requisition number was used in Block #2 (hyphens were still not used), and status was obtained. GTN's staff is well aware of these problems:

> GTN was originally bought as an off-the-shelf (COTS) product designed for the CSX railroad. The designers had never intended it to be used for such a big database or one with C2 capabilities. As such, it suffers with complex queries. The definition of a complex query is one that forces the query engine to search all or most of our 75 GIG database. The query engine is set up using a confusing set of instructions that results in a logically constructed query sometimes being transposed into a complex query. This results in seemingly simple requests in taking very long times to respond. (Tooker, E-Mail, 1999)

Besides the intermittent success with using specific queries, GTN's layout poses another concern or problem.

GTN's status pages are laid out in a horizontal scheme with the headings on the top and the statuses placed below them. There is so much data that it does not fit within the visible browser window which, forces the user to scroll back and forth to read the information. This becomes tiresome and monotonous after the user is forced to begin at the beginning of the status page (to the extreme left) after returning from a hyperlinked page, and then have to scroll back where they left off. Also, because the page is laid out horizontally with a lot of data which, does not fit within the browser window, printing from the web page becomes a problem. The user just needs to click on the browser's print button to begin printing, which works just fine, printing the entire status is where the problem is. Because the data are displayed horizontally and not contained within the browser window, the printer will only print the browser's main window. Scrolling to the right and then printing does not work. Each status page has the option of being saved as a Microsoft Excel spreadsheet, which once saved, can be printed in its entirety. Requisition queries are just one of the methods available to the user to get status information. A second way to conduct a query is through the Cargo query.

The Cargo Query menu, similar to the Requisition Query menu, is not without quirks. The first time using this menu yielded the familiar "No Data" response when conducting searches without knowing the TCN. However, since acquiring the TCNs for several of the CARR's requisitions, the Cargo Query Menu was used successfully. For

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the most part, the Cargo Query Menu looks similar to the Requisition Query Menu. The

only difference is that Block 2 picklist has a couple of new options to choose from.

Figure 6. Cargo Query Menu (GTN Cargo Query Menu, Web Page)

Nonetheless, the query using the Cargo Query Menu was done in the same fashion as the

requisition query. The only difference was in Block #2 where "TCN" was selected from

the available picklist choices. Unlike the Requisition Query Menu's Block 2, the entire

TCN, V212338337W059XXX, was able to be inputted (did not have to forgo any

numerals or letters) to make the search work for the first time. In fact, the TCN can be

entered without the "XXX" or letter designation, and still work. Blocks 1 and 3 through

8 were used in the same manner as with the Requisition Query Menu. GTN had a

response to the query within seven seconds of hitting the "submit" button. The initial

TCN status page contained much of the same information as the Requisition status page.

It basically summarizes some of the information to be found on what the author describes

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or calls the TCN data page. In order to get to the TCN Data Page, the user must click on the hyperlinked TCN located on the TCN Status Page. The Data Page is where GTN displays the ITV information for the item being shipped.

C. TCN DATA PAGE: THE HEART OF ITV STATUS

The user can get to the TCN data page in at least two ways: through the Cargo Query Menu or through the Requisition Query menu. If the user goes through the Requisition Query Menu, it will take a couple of extra steps to get to the Data Page, first by clicking on the hyperlinked TCN located on the original (or first) status page, and then clicking on the TCN again on the TCN status page.

The TCN data page is inundated with information (see APPENDIX G, note this page was downloaded as an excel spreadsheet, and not all data is displayed). This page contains the requisition's carrier (if known), ETA (Earliest Time of Arrival), ATA (Actual Time of Arrival), Location, ETD (Estimated Time of Departure), ADT (Actual Time of Departure), GBL, and Status at each of the locations. Furthermore, the page is broken down into six categories: requisitions status, movement to POE, On Hand Status, Schedule/Leg Movement, and Other Movement Events. If the user needs to know where his stuff has been, is, and will be, this is the page to go to. The TCN Data Page page in this author's opinion, is where GTN answers the questions presented in ChapterII: *Where's my part? When is it going to arrive? How's it going to being shipped?* Unfortunately, the TCN is not always readily available. The TCN may not be listed or displayed on the initial requisition status page if it has not been entered into the GTN system or if the item being shipped was consolidated in a container under a different

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TCN. What happens though, if the user does not know the entire requisition number or TCN?

D.   WILDCARD QUERIES

Chapter III discussed wildcard search techniques that are used to help the user find their shipments within the GTN system. This author conducted several requisition wildcard searches on January 20, 1999 that yielded results with varying time frames, anywhere between 5 seconds to an hour (maybe longer if the system did not "kick" the author off).

The first wildcard search used a question mark ("?"), which is considered a single character wildcard. (GTN E-Web Primer Web Page, 1999) This wildcard should be used when the user knows all but one digit in the requisition number, NSN, TCN etc. Basically, the question mark replaces the unknown digit and allows GTN to bring back all requisitions containing the other digits of the requisition number while ignoring the digit where the wildcard was placed. This can be better illustrated by going through an example. Once again using one of the USS CARR's ID code, V21233, as a basic template, a query was conducted for a possible requisition of V21233901?W. In this case, GTN would search for any requisitions generated by the USS CARR that began with Julian date 910 (January 10, 1999) up until the date the query was generated 915 (January 15, 1999) as in this case. GTN came up with a requisition number and status within 10 seconds of submitting the query. In this particular case, the USS CARR had submitted only one requisition within that time frame, V21233-9014-W071, Fuse

Cartridge, that was in the GTN system. This wildcard query displayed the same information that was displayed in a non-wildcard query.

Another query was conducted using the question mark wildcard query, only this time the character was used in place of the second "3", V2123?9014W. Now, GTN would have to search for all requisitions generated on the Julian Date 9014 submitted by any activity beginning with V2123. This query took slightly longer (20 seconds) which, was expected considering the search was more vague than the previous one. In this case, six requisitions were displayed that were generated on January 14, 1999. One of those requisitions was from the CARR, V21233-9014-W071, which was expected after finding it during the first wildcard search. The other five requisitions came from an activity with a code of V21236 (no name was given by GTN to establish the identity).

One last requisition query was conducted using another type of wildcard character, the asterisk (*). The asterisk is a "variable length" wildcard, and when used tells GTN to ignore "anything before or after the wildcard character". (GTN E-Web Primer, Web Page, 1999 and GTN Web Help Page, 1998) For this example, the requisition used was V212*. GTN began the long process of searching the database for such a vague query. After 20 minutes, GTN displayed 617 line items or rows (each row corresponding to an individual requisition) while still continuing to download. The first row began with V21201's (USS ROBERT G. BRADLEY FFG 49) requisitions beginning with a Julian date of 3295, and continuing on until row 1220 (Julian date of 9019). Rows 1221 to 2827 were for V21218 (USS WHIDBEY ISLAND LSD 41) beginning on the Julian date of 7139 and ending on 9015. By this time 37 minutes had

elapsed and 5310K bytes of information had been downloaded. GTN continued to download requisitions until 58 minutes into the search when the system froze on row 6204. In just 58 minutes GTN had the status for 6,204 requisitions generated from five ships, and if not for the system locking up, would probably have continued for another hour or more.

E.   COMPARISON OF INFORMATION

Getting the status of requisitions is just one aspect of GTN, how current the information is the other. The queries conducted on the USS CARR's requisitions were done on 15 January 1999, but only one requisition out of nine had a status up to the current date. Seven requisitions displayed status "As Of" between 7 December and 30 December. One of the requisitions had a status that was projected out to June 19, 1999. And one requisition did not appear to be in the GTN system, indicated by the "No Data" message. According to GTN system representative:

> Often on-hand updates take longer to record in the data base due to the time it takes the final transfer (truck, ship, helo, RHIB, etc) to be recorded by the SUPPO and forwarded via the SALTS network to the GTN database. Factor in the holidays and you'll find an annoying gap in the system. Bar code readers work great at airports and truck depots, especially when the information is linked via satellite to a centralized data base. (Tooker, E-Mail, 1999)

Remember, GTN's database is fed by 18 sources of information discussed in Chapter III, and how well GTN performs depends upon the quality, and timely input from those sources. (Hanes, 1999) And without the timely input of data, the user is faced with old status information regarding their shipment or requisition, as in the case of the USS CARR.

The information displayed on the initial status page for each of the USS CARR's requisitions did not change after eight days, January 15 through 23, 1999. Another point of interest is that it appears that the TCN data page has more up to date status or at least a better "picture" of the requisition status. To illustrate this better, look at Appendix F and Appendix G, which contain status information regarding the CARR's fire pump motor. Appendix F shows that the fire pump motor is "on hand", "receipted", and location "unknown" as of 0000Z on 8364 (30 Dec 1998). If the user did not search further, for example, clicking on the requisition's TCN, he/she might dismiss the information as the "actual" status of the shipment, and conclude the information is "old". However, if the user searched deeper within GTN by going to the TCN data page, s/he would see a different picture of their requisition, as Appendix G illustrates.

As in the case of the CARR's fire pump motor, it becomes apparent that the information depicted on the original status page correlates to the information found under the "requisition status" column of the TCN data page; however, that date and status is by no means the most current information. Working down the "Onhand Status" column, on 9005 (January 5, 1999) the fire pump motor was on hand in Norfolk, VA., and its status was MNL (Manifested Loose). Continuing down through the Schedule/Leg Movement column, the user can trace the fire pump's movement to the most current status GTN holds which, in this example, is 9011 (January 11, 1999) when the fire pump departed Norfolk, Virginia. This date, 9011, although still not "current", is a lot better than seeing the date 8364.

This brief example shows some of the complexity of GTN. The user must know "where" to find the information in GTN through the myriad of hyperlinks and codes, as well identify the pertinent information from the not so pertinent. An example of this is the "As Of" field's hyperlink located on the initial status page for either Requisition or Cargo queries, which links to the Time Reference Page.

The "As Of" field which, contains the status time, along with the "Date" field, gives the impression that this time and date are the most current status of the requisition. However, this is not necessarily true as pointed out earlier. Additionally, the time field, which is a hyperlink, leads to a page that this author calls the Time Reference Page (for lack of title displayed on the web page), and gives Zulu times throughout the world.

By looking at the Time Reference Page for the CARR's fire pump (page 1 of Appendix H—don't look at page two yet), the initial impression is "wow", some good stuff here. At first, it looks like a history of the requisition's movement, but is not. As a "user" of GTN, a historical record of the movement of the requisition would have been expected here, and would have had utility. Now, look at the second page of Appendix H that has the Time Reference Page for the CARR's relay. And what do you know, it looks the same, with the exception of the Zulu times (that's the only thing different). In fact, looking at all eight requisitions from the CARR, the page looks the same except for the times. The author is not questioning the relevance of the Time Reference Page, only to its perceived importance given its location and ease of finding it. Yet, for the user to see ITV information and get the "big picture" of their requisition status, s/he has to get there through the requisition's TCN, which is not always available on the GTN system.

The Global Transportation Network does provide ITV information, albeit not "real-time". Nonetheless, customers demand accurate and timely information regarding their shipments. How well does GTN compare with a commercial ITV tracking system such as Federal Express, which happens to be one of the sources of ITV information for GTN?

F.   FEDEX: THE BENCHMARK FOR GTN

For the purpose of this thesis, only the layout and information available on the main tracking page will be examined. The database intricacies will not be discussed. To examine the difference between status page layout and ease of finding shipment information, two FedEx tracking numbers were used: 420554060300 and 811235729442 and input in the main tracking page. Although FedEx contains an "Advance Tracking" page, it was not tested, but will be briefly discussed.

Like GTN, FedEx uses web-based technology. All that is necessary is a web browser, and unlike GTN, there are no restrictions on the type of Internet browser to use. To find the status of a shipment using FedEx, the user must go to the FedEx tracking page (see Appendix I, p.1). (FedEx Home Page, Web Page, 1999) The main tracking page only has three blocks vice eight for the user to deal with. And only the first block has uses a picklist vice the multiple picklist block layouts of GTN. The remaining two blocks are text blocks in which the user must input information. The Advance Tracking Page is similar in appearance to the main Tracking Page in that it contains only three blocks to define the query. The first block, like the main Tracking Page, is the only block that contains a picklist. However, the Advance Tracking Page's First Block is not used to

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input the destination country, but to define the type of tracking number. The Advance Tracking Page's first block allows the user to choose from six picklist options to help define the search query. The other two blocks are text boxes in which the user must input the number specified in Block 1 and the second is to input the shipping date.

Conducting a query using FedEx's main Tracking Page is as simple as "one-two-three". The user must first pick a destination country from the first Block's picklist, then type in the Airbill Tracking Number followed by the Ship Date. In this example, airbill numbers 42055406033 and 811235729442 with a ship dates of 1/27/99 and 1/28/99 were used. Once the information has been entered, the user initiates the search by pressing the "Request Tracking Info" button.

The search result is received within 3 to 5 seconds after initiating the search. The status is displayed on the "Results" Page. And unlike GTN, the Result Page is simple yet contains all the necessary ITV information required by customers (Appendix I, pp. 2-3). Additionally, codes and hyperlinks that the user must navigate and sort through to get their all their information do not weigh down the FedEx page. Although FedEx's tracking features are easy to use and uncluttered, there is one problem. What if the customer does not know the airbill tracking number or other tracking numbers listed on the Advance Tracking Page?

The customer must get the information from the shipper. Sometimes this process may take some time because in some cases when a customer places an order, the sales representative does not know the tracking number until it has been assigned by the shipping department. In this case the user must call the shipping representative or wait

until the sales or customer service department receives the information from shipping. And depending on the time of day it is and business hour, the customer may have to wait until morning. And, with overnight delivery, the customer may get their shipment before ever getting its tracking number. (Basinger, Interview, 1999) Additionally, FedEx's tracking system does not provide for wildcard searches; the user is constrained by the available picklist choices. Despite these shortcomings, FedEx's page layout, in this author's opinion, is superior to GTN.

The Tracking Page is simple and to the point; it's not burden with too many options for defining the search. Also, the Tracking Results Page is not inundated with superfluous data. And one last point, the web pages are "printer" and "user" friendly. Printing the status page is easy, all the user has to do is "hit" the browser's print button, and the entire document will be printed. And to view the document the user only has to scroll down and read the status. The heading of the status is conveniently located on the left margin and the status is printed on the right. This layout is completely different from GTN's which, is laid out horizontally.

G.   METHODOLOGY: SUPPLY CORPS ASSOCIATION SURVEYS

So far this thesis has addressed the principles of using GTN and even managed to give a user's perspective on it based on the author's experience. However, the real test of GTN, and hence, the main question, is whether or not GTN is being used in the Fleet, specifically by the Supply Corps Officers. For what good is a system if it's not being used? In order to get a basic idea of whether or not GTN is being used survey questions were sent to a small group of Supply Corps Officers.

In the interest of time, the survey questions were sent only to a small sample of Supply Corps Officers belonging to the Naval Postgraduate School's Supply Corps Association. A total of 71 surveys (see Appendix J) were distributed via electronic mail (email). The questions consisted of 15 "fixed" response questions and three "free" response questions. The respondents were given 14 days to submit their answers to the survey questions. Thirty-one responses were received for a 43.6 % response rate. Three surveys were returned as "undeliverable".

H.   FINDINGS

Three figures were constructed to summarize the results from the "fixed" response questions: Figure 7: (GTN Knowledgeable) - individuals who completed Part I (heard about GTN, but may or may not have used it), Figure 8: (GTN User) - individuals who have used GTN, and Figure 9: responses for Part II of the survey. Of the 31 responses, 21 individuals had heard about GTN. And of those 21 respondents, 10 had heard about GTN from NPS, 5 at work, 3 from conferences or briefs, 1 during a conversation, and 2 gave no response.

	No Resp.	Yes	No	Don't Know	Great	Ave	Little	None	Don't Care
Have you heard of GTN?		21	10						
Do you know what GTN is?	2	18	1						
Do you know what GTN can be used for?	2	16	3						
Have you used or do you currently use GTN?		6	15						
To what extent do your seniors know about GTN?	3			6	1	3	6	2	
To what extent are you supported by your command to use GTN?	5					2	7	7	

Figure 7. Summary of Responses from "GTN Knowledgeable"

	No Resp.	Yes	No	Don't Know	Greatly	Ave	Little	None	Don't Care
Do you use GTN to track supplies, services or other types of shipments?	1	4	1						
Have you used the system's "Feedback" form to get help?	6								
To what extent did GTN create more problems?	1						3	2	
To what extent did GTN create extra work?					1		3	2	
To what extent do you like using GTN?					2	3			1

Figure 8. Summary of Responses from GTN Users

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	No Resp.	Yes	No	No Interest	Too much work	The system or method I use is just as good
Now knowing the basic capability of GTN, would you use it?	1	7	1			
If you answered "no" to question 1, why would you not use GTN?	1					

Figure 9. Summary of Responses for Part II

Although the survey was sent to a small group of Naval Supply Officers, it does shed some light on how GTN is perceived, and used. Sixty seven percent (67%) of the respondents said that they had heard of GTN, however, most of them indicated that they had heard about it while attending the Naval Postgraduate School. The second most common response was learning about GTN through work. Of the 21 respondents who heard about GTN, only 6 (28%) actually used GTN. Fifty percent of the users learned to use GTN on their own. Only four of the respondents used GTN to track parts, supplies etc., and indicated that little to no problems were encountered while using it. With the exception of one user, most indicated that GTN did not create extra work. For most of the respondents, using GTN was a favorable experience. When asked what else they would like to GTN do (question 16): one respondent wanted to see GTN "provide timely, accurate supply status that ALL users can rely on." The second respondent indicated that they would like to see GTN "interface with NATO systems..." especially when participating in combined NATO operations/exercises. It would be useful to track material that were in the NATO systems, such as ADAMS. (Survey Responses, 1999)

I. CHAPTER SUMMARY

Chapter IV examined a new user's perspective on conducting queries through the Global Transportation Network. In so doing, several problems or quirks were pointed out in using the GTN system. Namely, these were inconsistencies involving how to input information to define search parameters, layout deficiencies, and "not so timely" status information.

The chapter also compared GTN's query and status layout with Federal Express's tracking page layouts. FedEx's tracking layout can be described as simple yet functional. FedEx provides "user friendly" In-Transit Information displayed in an easy to read format. Additionally, the status appears to be much more "real-time", minutes vs. days compared with GTN.

Lastly, the chapter briefly looked at how prominent GTN usage was in the Fleet by examining survey responses sent to the Naval Postgraduate School's Supply Corps Association. For the most part, the results indicated that GTN was not being used extensively; however, the survey results are biased due to the surveys being sent only to the Naval Postgraduate Supply Corps Association. A larger or more comprehensive survey needs to be conducted to reach a more concrete representation of GTN's usage in the Fleet.

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. SUMMARY

The main purpose of this thesis was to see how well the Global Transportation Network was performing in the area of intransit-visibility as compared with a commercial tracking system such as the one used by Federal Express. This thesis concludes that GTN does provide intransit-visibility information, albeit not real-time status information, and is contingent upon the shipment having a Transportation Control Number.

GTN is an integrated database system that is supposed to provide users with "real-time" in-transit visibility information over their shipments. To provide users with current status information, GTN relies on the timely, and accurate input of data from eighteen systems that feed GTN's database with ITV information.

GTN, for the most part, is easy to use. The user uses a query menu to initiate the search. The query menus facilitate "by-the-number" searches that allow the user to define their search by the options they select within a Block's picklist. However, there are quirks or inconsistencies on how to input the required information. The user may or may not have to input the entire requisition number for the part they are looking for.

GTN's status pages are laid out in a horizontal scheme with the heading on the top and the statuses placed below them. This horizontal layout prevents the user from being able to print the entire document using their web browser's print function as not all the information is contained in the browser's open window. The user must save the document as an Excel spreadsheet in order to print the entire document.

GTN's in-transit information is not readily available to the user or advertised to the user. The ITV information that GTN does display is not always up-to-date, and it is

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definitely not "real-time". The statuses encountered while conducting research for this thesis were anywhere from a few days to few weeks old. This is compounded by the fact that GTN gives the status of the requisition or cargo in at least two different areas, and depending upon where the user goes or does not go s/he may not have the most current status of their part. The time and date of the status contained in the main requisition status page usually does not reflect the most current status. To get the most current status, the user must go the TCN Data Page by using the shipment's Transportation Control Number.

Survey results from the Naval Postgraduate School's Supply Corps Association did not paint a picture of GTN usage. Although most indicated that they heard about GTN, while attending the Naval Postgraduate School or through conferences, most did not use it. However, these results were biased due to the surveys being sent only to the Naval Postgraduate Supply Corps Association.

B. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusion: In-Transit Information is not readily accessible or well advertised from the status pages.

The user must go through one to two links before obtaining ITV information, starting with going through the Transportation Control Number's hyperlink. The ITV information is contained in the TCN Data Page. If the user is new to GTN, they would not know where to look for ITV information and would only find it by the trial and error of going through the status page's hyperlinks one by one.

Recommendation: There should be a hyperlink that is displayed on the primary status page that says "ITV" or something similar (as long as it is recognizable) that will bring the user to the ITV data page.

2. **Conclusion: The most current status is not necessarily displayed on the initial output page.**

The main status page only displays the most current "onhand" status date and time. This, however, is not necessarily the most current status. The most current status is displayed on the TCN Data Page.

Recommendation: Display the most current status of the shipment on the main status page regardless if it is onhand or in-transit.

3. **Conclusion: Status information is not "real-time".**

The status information tended to be rather old, anywhere from a few days to weeks.

Recommendation: Emphasis needs to be placed on the receiving parties to input the data into the GTN system as soon as the shipment is received or shipped. If possible, hand held scanners, interrogators, along with barcodes, should be used to the maximum extent practicable.

GTN administrators are well aware of the status problems. Unfortunately, GTN is dependent upon outside sources for ITV information. If these sources are not inputting the needed ITV data, GTN status information can not be updated.

4. **Conclusion: There is a database problem associated with the way the database programming codes were written.**

This became evident when the system did not consistently allow for complex queries, such as inputting the entire requisition number and using more restrictive or narrow search parameters. In order to get a consistent search results, the user must use the most simple search variables to define the search parameters within the query menus.

Recommendation: Re-write the programming code to facilitate complex queries and if necessary, upgrade the hardware and software to meet the demands for a more comprehensive code.

GTN's Program Management Office is already aware of the query problem and is in the process of re-writing the database's code and upgrading the system's software. Hardware upgrades have been completed.

5.   Conclusion: The layouts of the GTN status pages are not user or printer friendly.

The status pages are formatted horizontally with the status headers located at the top of the page and their status or information placed below them. This format does not facilitate the status display being visible within the browser window. The user must scroll back and forth in order to read the status of their shipment. This becomes tiresome if the user has to go back and forth between hyperlinks, as the user upon returning to the status page is not brought back to where they left off. The user has to scroll back to find where they left off. Also, due to the information not being contained within the browser window, the user will not be able to print the status page using the browser's print button. The only portion of the document that can be printed using the web browser is that which is contained within the visible browser's window. Scrolling to the right, to bring the rest of the information within the visible browser's window, and then printing, does not work.

Recommendation: GTN should go to a vertical display format like the one used by Federal Express. The status headers can be placed on the left-hand margin and the information or status displayed immediately to the right. This will make reading the page easier as well as allowing the user to print the entire status using the browser's print button.

Currently, the only way to print the entire status document is to save the status as an Excel Spreadsheet and then printing it.

6.   Conclusion: It is hard for the casual user to distinguish pertinent fields and data pages from not pertinent data fields and pages.

This is correlated with the amount of codes and abbreviations used. If the user does not recognize the field, they must go to the amplification page or use the GTN Help desk to get their answers. Additionally, there is one particular data field that leads to a "Time Reference Page" that does not serve any particular purpose except to see what time it is in Zulu time at some other part in the world. This page has no immediate utility to the user. Yet this page is easily accessible from the initial status page. On the other hand, for the user to get ITV information, he/she needs to go through two hyperlinks from the requisition status page or one hyperlink form the cargo status page.

Recommendation: Remove any unnecessary or redundant fields from the initial status page. If the user requires extra information such as weight, volume, priority, mission numbers etc., have a separate link to a "comprehensive status" page which can contain all the "bells and whistles" regarding the shipment status. Also, recommended is removing the hyperlinks to the "Time Reference Page" from the status pages, and, instead,

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allow the user to access the page by utilizing one common hyperlink located at the top or side of the browser window. As well, the "Time Reference Page" can become apart the GTN User Guide or incorporated into the Help Page.

7.   **Conclusion: Some of the status page headers contain unrecognizable abbreviations without a way of finding their meaning.**

This relates to the fact that GTN uses too many codes and abbreviations to "inform" the user regarding their shipments. Unfortunately, not all of the abbreviations, such as the ones used in the status headers, have an area in which the user can find their meanings.

Recommendation: The GTN User Guide or GTN Help Page should contain a list of all the commonly used terms, abbreviations, and codes with their corresponding meaning, or develop a "GTN Commonly Used Terms and Abbreviation Page". Regardless, the user should be able to access this page from wherever they are in their search (query menu or status page).

GTN's new Customized Site's Help Page (February 1999), accessible through the query pages, now contains list of all abbreviations used and a brief description of each.

8.   **Conclusion: The GTN status page is heavily dependent upon abbreviations and codes making it difficult, especially for the casual user, to recognize the important information from the not so important information regarding shipment status.**

For the unfamiliar or casual GTN user, the GTN status pages contain an intimidating amount of codes and/or abbreviations that may or may not be hyperlinked to

definition or amplification page. This format forces the user to waste time in finding the meaning of the codes and/or abbreviations before they can comprehend the status of their shipment.

> **Recommendation:** Limit the amount of codes and/or abbreviations used within the status page. The status page should contain easy to read information containing the status of the shipment. Thee initial status page should only contain the most current information that was input into the system whether or not it is intransit or onhand at some location. For example: the status page could contain the following information: Date and Time, Location, Status (onhand, scheduled to depart, intransit, etc.), and Future Status (where is scheduled to go next) with Estimated Time of Departure and Expected Day of Departure. Additionally, a link could be incorporated to take the user to an ITV page, which would contain the entire history of the shipment's movement and future movements. The layout used by Federal Express would provide a good benchmark to design a better layout for GTN status pages.

Currently the TCN status page contains the ITV information with the most current status of the shipment. However, the main or initial status page does not always contain the most current status only the most current "onhand" status. The user needs to know the current status, whether or not it's onhand or intransit in order to provide the most current and complete status to his or her commanding officer.

9.   Conclusion: GTN usage is not widely used in the Fleet.

A small survey sent to Supply Corps Officers affiliated with the Naval Postgraduate School's Supply Corps Association, indicated that GTN was not widely used in the Fleet.

Recommendation: First, a more detailed survey needs to be conducted to get a better understanding of the GTN's usage in the Fleet. Second, more advertisement or promotional activities need to be done to educate supply personnel on GTN's capabilities and what it can do for them. This needs to be done outside the academic setting. This can be accomplished by holding more conferences, putting an article in "Proceedings" or other professional naval publications.

C.   FURTHER RESEARCH AREAS

1. How accurate is the status given by GTN compared with other navy systems: i.e., SALTS?

2. How feasible is GTN to the Fleet, especially shipboard personnel, due to the fact that GTN is web based and access to the Internet is a requirement?

3. How can GTN be implemented for shipboard supply personnel given access to the Internet is required?

4. Is there a need for GTN NATO interface in light of Joint Maritime Operations, especially with allied nations? If so, how can this be implemented while maintaining system and DoD security measures?

APPENDIX A - GTN SOURCES OF INFORMATION

AMC Deployment Analysis System (ADANS).
ADANS is the current system supporting AMC airlift and air mobility planning and scheduling. It provides the planners and schedulers the automated tools necessary to plan for and schedule the extensive number of air mobility missions flown by AMC during peacetime and contingency operations. ADANS schedules airlift and air refueling missions under all scenarios. (GTN Information Feeds, Web Page, 1998)

Asset Management System (AMS).
AMS is a transportation management system that automates the management of the DoD Interchange Freight Car Fleet and the Common User Container Fleet. It will provide greater asset visibility; enhance utilization, and improve maintenance, tracking and rail revenue auditing. (GTN Information Feeds, Web Page, 1998)

Cargo Movement Operations System (CMOS).
CMOS is the Air Force unclassified system for transportation units that provides the capability to effectively plan, document and manage outbound and inbound cargo, airlift manifests, truck manifests, pallets, shipment units loaded into all consolidation containers TCMD, single shipment units TCMD, outsized dimensions, ammunition round count, hazardous material, stock number and IMCO classification, net explosive weight and lot number(s), general miscellaneous information, additional required hazardous material information, end manifests, passenger manifest records, passenger header records, passenger data records. CMOS enables users to plan, schedule, and monitor the execution of transportation activities in support of deployment and reception of forces. The CMOS traffic management module is to migrate to TCAIMS II. (GTN Information Feeds, Web Page, 1998)

Consolidated Aerial Port System II (CAPS II).
CAPS II is an AMC unclassified automated system which provides cargo and passenger movement data to HOST and PRAMS. CAPS II has three application modules which encompass aerial port command and control operations, passenger processing and manifesting, and cargo movement processes. The Global Air Transportation Execution System (GATES) is being developed to replace CAPS II. (GTN Information Feeds, Web Page, 1998)

CONUS Freight Management (CFM).
CFM is MTMC's unclassified system providing automated support to TOs and MOs for transportation processing and planning. CFM receives EDI transactions from transportation systems. CFM will provide movement status (Implementation Convention 858) on cargo moved within CONUS. (GTN Information Feeds, Web Page, 1998)

Defense Automated Addressing System (DAAS).
DAAS is the Defense Logistics Agency's (DLA's) unclassified system for automatically routing Military Standard Requisition and Issue Procedures (MILSTRIP) transactions among customers, suppliers, depots, and shipping activities. DAAS will supply GTN information on the status of requisitions ordered via MILSTRIP. Currently, not all requisitions are routed through DAAS. (GTN Information Feeds, Web Page, 1998)

Defense Transportation Tracking System (DTTS).
DTTS is operated by the Naval Supply Systems Command/Navy Material Transportation Office for DoD. DTTS is the DoD unclassified system for near real-time tracking of Class I-IV explosives shipments moving via truck or train within CONUS. DTTS receives location reports every two hours from trucks and trains using commercial satellite-based tracking systems. An interface to GTN provides movement and shipment data. (GTN Information Feeds, Web Page, 1998)

Global Air Transportation Execution System (GATES).
GATES automates support for receipt, movement and billing of cargo and passengers. GATES replaces AMC's command and control transportation applications currently residing on a mainframe, which include the Headquarters On-line System for Transportation (HOST), the Passenger Reservation and Manifest System (PRAMS) and the Consolidated Aerial Port System, Second Generation (CAPS II). GATES will provide enhanced capability through a graphical user interface and increased architecture, which will improve communications from the aerial ports. (GTN Information Feeds, Web Page, 1998)

GO81/Broker Aircraft Maintenance System
GO81, an AMC maintenance system for C-5, C-9, C141, KC-135, and C-17 aircraft, has provisions to accommodate other transient aircraft. GO81 provides automated support for maintenance activities at fixed and key enroute strategic airlift locations. GTN will use GO81 to report aircraft availability based on maintenance priorities. The GO81 should include four USMTF messages. (GTN Information Feeds, Web Page, 1998)

Global Command and Control System (GCCS).
GCCS is the primary joint system designed to fulfill the requirement for a capability to move a US fighting force on the globe at any time providing the services, unified commander and components with the information and direction necessary to complete their mission. GCCS objective is to provide the war fighter with a common, real-time picture of the battle space and the ability to order, respond, and coordinate horizontally and vertically to accomplish the mission. GTN serves as the transportation module for GCCS, providing planning, command and control, and Intransit visibility of aircraft/departure, aircraft scheduling and status information. GTN provides GCCS scheduling and movement information. (GTN Information Feeds, Web Page, 1998)

Global Decision Support System (GDSS).
GDSS, AMC's primary C2 system, is the source of planned and actual itineraries, and scheduled ULN allocations for all AMC carriers and tankers. GDSS provides GTN with

real time updates as information changes. GDSS provides data concerning airlift mission schedules, actual departures and arrivals of aircraft, and summary information on what the aircraft (AMC organic or commercial) is carrying, to include OPLAN ULNs, short tons of cargo, and number of passengers being transported. Consolidated Air Mobility Planning System (CAMPS), the AMC system used to schedule airlift missions, including the planned cargo allocation, provides schedule/allocation data via GDSS. GDSS sends USMTF formatted messages to GTN. (GTN Information Feeds, Web Page, 1998)

Groups Operational Passenger (GOPAX) System.
The GOPAX system is MTMC's automated support for movement of DoD groups of 21 or more passengers on air, bus, or rail carriers within CONUS. The GOPAX system receives requests for service from installations via Transportation Coordinator's Automated Information for Movements Systems (TCAIMS), telephone, mail, and direct access to GOPAX. Routing instructions are sent to the carrier and to the ITO/customer. GOPAX provides GTN with group movement data. GOPAX provides GTN bus carrier information pertaining to offer confirmation, requests, and passenger names. (GTN Information Feeds, Web Page, 1998)

Integrated Booking System (IBS).
IBS is the first automated system to standardize cargo booking procedures for unit and non-unit CONUS to OCONUS ocean-eligible cargo. IBS will receive cargo offerings from the shipper, recommend the cost favorable carrier and appropriate Sealift Port of Embarkation(SPOE) and pass the offering to the selected carrier. IBS then passes booking strategy, based on MSC contracts/agreements, to the port for booking. Additionally, it schedules unit arrivals at ports and issues port calls to units. (GTN Information Feeds, Web Page, 1998)

Joint Air Logistics Information System (JALIS).
JALIS assists USTRANSCOM with schedule coordination for operational support aircraft from all Services. It provides schedules, itineraries, and information for OSA aircraft to GTN. (GTN Information Feeds, Web Page, 1998)

Transportation Coordinator's-Automated Information for Movements System II (TC-AIMS II).
TC-AIMS II consolidates the management of the installation-level transportation functions of unit movement, load planning, and ITO/TMO operations. TC-AIMS II becomes the standard installation-level unit deployment and sustainment system for all Services. The functionality contained in the cargo and passenger movement portions of the ITO/TMO segment of TC-AIMS II are the core of the application. While the planning of unit movements has several unique aspects, the execution of unit movement operations are largely a specialized case of personnel and cargo movement. TC-AIMS II must have the capability to create container-content relationship records for Exercise cargo before interface with WPS and IBS. TC-AIMS II will use the same core of functionality to support routine ITO/TMO operations and unit movement execution. (GTN Information Feeds, Web Page, 1998)

Transportation Coordinator's-Automated Information for Movements System (Marine Corps)(TC-AIMS (MC)).

Marine Air-Ground Task Force/Logistics Automated Information System (MAGTF/LOG AIS) is a family of systems designed to plan, manage, and execute U.S. Marine Corps unit deployments and redeployments. It provides USMC operating forces (active and reserve), base, station, commanders with automated tools for command and control (C2) of force deployment planning and execution and assistance with day-to-day management of transportation activities. Within CAIMS(MC)/MAGTF Deployment Support System II (MDSS II), capabilities exist to create and maintain an inventory of transportation support assets; and to create, send, receive and execute transportation and support requirements. Additionally, it provides an interface with JOPES. This interface will be phased-out as TC-AIMS II becomes operational. (GTN Information Feeds, Web Page, 1998)

Transportation Coordinator Automated Command and Control Information System (TCACCIS).

TCACCIS is a unit movement and ITO support system which supports U.S. Army deployments during both day-to-day operations and crisis situations. It focuses on providing automated support to the planning and execution functions of transporting unit equipment, personnel, and cargo under full mobilization and deployment conditions at all organizational levels. It standardizes operations in the areas of data collection, shipment accountability, shipment processing, documentation, and reporting. This interface will be phased-out when TC-AIMS II becomes operational. (GTN Information Feeds, Web Page, 1998)

Worldwide Port System (WPS).

WPS is the MTMC worldwide unclassified system for managing export and import of DOD cargo at water ports. It provides detailed data concerning items of cargo arriving, departing, and on-hand at water ports. WPS records cargo data for surface movements at MTMC area commands; receipt, staging, and loading cargo at ports; and generates the ship manifest/booking upon completion of vessel loading. (GTN Information Feeds, Web Page, 1998)

Future Sources of Interfaces

Consolidated Air Mobility Planning System (CAMPS). CAMPS is a migration system for ADANS and currently under development. It will supports peacetime, crisis/ contingency, and wartime mobility planning, scheduling, and analysis for air transportation assets. CAMPS primarily supports AMC military airlift, aerial refueling, and commercial aircraft missions. CAMPS and the Global Decision Support System (GDSS) do planning and scheduling for transportation airlift missions, thus providing planning visibility from origination of the mission requirement to the actual scheduling. CAMPS will provide GTN with channel requirements data, DD Form 1249 SAAM Airlift Requests, and air refueling quarterly planning schedules. (GTN Information Feeds, Web Page, 1998)

Financial Air Clearance Transportation System (FACTS).
FACTS consolidates all Service/Agency Air Clearance Authority and transportation financial management systems' functionality into a single, automated DOD air clearance authority and financial management system. (GTN Information Feeds, Web Page, 1998)

Integrated Command, Control, and Communication (IC3) System.
IC3 is MSC's system for planning, monitoring, and controlling the movement of ships owned and chartered by MSC. IC3 will integrate Headquarters Locator Module (HELM), MSC Ship Register (P504), Sealift Strategic Analysis System (SEASTRAT),Operations Support System (OSS), and Bulk Petroleum, Oil and Lubricants (POL), all of which are existing C2, transportation, and planning systems. IC3 interface will provide GTN with ship schedules, ship position data, and ship port information. (GTN Information Feeds, Web Page, 1998)

Intelligence Data Handling System (IDHS).
Joint Intelligence Center-Transportation (JICTRANS) Secret Modernized Integrated Data Base (MIDB) and Secret Imagery Product Archive (IPA). The Secret MIDB contains the transportation infrastructure database which is available to queries from GTN. The IPA is populated with transportation specific Secret level image products which may also be pulled from the IPA. MIDB and IPA will be accessible through GCCS with the implementation of MIG (MIDB, IPA, and GCCS) software designed to provide seamless access to these data bases from GCCS. In the future, intelligence data will be provided by the General Intelligence Support Services (GISS) program. (GTN Information Feeds, Web Page, 1998)

Joint Simulation System (JSIMS).
JSIMS will produce products that create and sustain a simulation environment capable of meeting a broad set of requirements for training and mission rehearsal (exercise). Interface with GTN is a key performance parameter for the JSIMS program. This interface will allow a GTN user to train or exercise using GTN with information provided from the JSIMS environment. There should be no difference between using real world data or JSIMS provided data. GTN will interface with JSIMS to provide the transportation, deployment and redeployment modeling and simulation requirements. (GTN Information Feeds, Web Page, 1998)

Joint Warfighting System (JWARS).
JWARS is a closed-form, constructive simulation of multi-sided joint warfare for analysis. Users of JWARs include combatant commanders, Joint Staff, Services OSD and other DoD organizations. Applications include evaluation of courses of action; analysis of force sufficiency, assessment of force structure alternatives; Joint Warfare Capability Assessment (development of joint capability issues and assessment of trade-offs); determination of requirements for new warfighting capabilities; analysis of weapon system alternatives, in particular, cost and operational effectiveness analysis; and analysis of alternatives for program and budget reviews.
(GTN Information Feeds, Web Page, 1998) ·

Load Planning Systems.
GTN will have the capability to accept load plans and stow plans developed by applications such as Automated Air Load Planning System (AALPS) and Integrated Computerized Deployment System (ICODES). Information developed in these applications will be passed to GTN through established interfaces such as GDSS, TC AIMS II, and WPS. AALPS assists users in loading Air Force and commercial transport aircraft. It takes data input of personnel to establish gross load planning information, and it produces fully certified load plans for single mission, brigade sized or multiple division sized airlift deployment requirements. ICODES supports vessel loading requirements for all Services and provides the opportunity to develop and evaluate alternative solutions by predicting problems and preventing their occurrence. (GTN Information Feeds, Web Page, 1998)

Munitions Transportation Management System (MTMS).
MTMS is an Army Material Command (AMC) system used by the Joint Munitions Transportation Coordinating Activity (JMTCA) for ship planning unique to munitions movements. MTMS receives Service export munitions movement requirements and consolidates them into shipload packages that are offered for lift to the respective MTMC area commands. MTMS provides MTMC with key shipment information and Service, CINC, and receiving facility representatives with advanced ship planning information. MTMS is used to identify commercial asset requirements (rail/truck) to support each ship plan. Manifests from departing vessels is reconciled with ship plans. (GTN Information Feeds, Web Page, 1998)

Other Logistics Systems.
Currently, requisitions for Petroleum, Oil and Lubricants (POL), ammunition, rations, medical supplies, and Army and Air Force Exchange System (AAFES)/Navy Exchange (NEX)System personal convenience items do not go through the Defense Automatic Addressing System (DAAS). Also, third party logistics systems are not necessarily captured in DoD supply/transportation systems. Procedural and technical changes will be necessary to change the current routing of data for these items. If it is not possible to route all requests for supplies through DAAS, individual GTN interfaces with each of the systems used to process these types of commodities will be necessary. (GTN Information Feeds, Web Page, 1998)

TRANSCOM Regulating and Command and Control Evacuation System (TRAC2ES).
TRAC2ES is the DoD medical regulating and aeromedical evacuation patient movement system. TRAC2ES merges medical regulating and aeromedical evacuation flight planning into a single comprehensive system to support the cost effective transportation of DoD patients in peace and war. AC2ES will provide GTN ITV of patients, patient attendants, and aeromedical evacuation crews and equipment, via planned and actual information for medical evacuation missions manifested in TRAC2ES. GTN will provide TRAC2ES with visibility of inter- and intra- theater lift assets and movements of lift capable of being used for medical evacuation.
(GTN Information Feeds, Web Page, 1998)

APPENDIX B - ACRONYMS AND ABBREVIATIONS

AIT	Automated Identification Technologies
AMC	Air Mobility Command
ANSI	American National Standards Institute
ATCMD	Advance Transportation Control and Movement Document
CAPS II	Consolidated Aerial Port System II
CAT	Crisis Action Team
CINC	Commander In Chief
CMOS	Cargo Movement Operations System
CONUS	Continental United States
C2	Command and Control
DAAS	Defense Automated Addressing System
DISN	Defense Information System Network
DODAAC	Department of Defense Activity Address Code
DoD	Department of Defense
DSN	Defense Switched Network
DTS	Defense Transportation System
DTTS	Defense Transportation Tracking System
EC	Electronic Commerce
EDI	Electronic Date Interchange
EDIFACT	EDI for Administration, Commerce and Transportation
FTP	File Transfer Protocol
GDSS	Global Decision Support System
GPS	Global Positioning System
GTN	Global Transportation Network
HOST	Headquarters On-line System for Transportation
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
INMARSAT	International Maritime Satellite
ISP	Internet Service Provider
ITV	In-Transit Visibility
ITIGG	International Transport Implementation Guidelines Group
JTAV	Joint Total Asset Visibility
JTCC	Joint Transportation Corporate Information Management Center
LAN	Local Area Network

METS II	Military Export Traffic System
MILNET	Military Network
MILSTRIP	Military Standard Requisitioning and Issue Procedures
MSC	Military Sealift Command
MTMC	Military Traffic Management Command
NSN	National Stock Number
OCONUS	Outside Continental United States
POD	Point of Debarkation
POE	Point of Embarkation
PRAMS	Passenger Reservation and Manifesting System
RF	Radio Frequency
TAV	Total Asset Visibility
TERMS	Terminal Management System
TCACCIS	Transportation Coordinator Automated Command and Control Information System
TC-AIMS	Transportation Coordinator's-Automated Information for Movements System II
TCC	Transportation Component Command
TCMD	Transportation Control Movement Document
TCN	Transportation Control Number
ULN	Unit Line Number
USTRANSCOM	United States Transportation Command
VAN	Value Added Network
WAN	Wide Area Network
WPS	Worldwide Port System

APPENDIX C - GTN USER REQUEST LETTER

User Request sample letter and mandatory information
(Unit Letterhead **REQUIRED**)

233d TRANSPORTATION SQUADRON
222 WILSON AVENUE
LANGLEY AIR FORCE BASE VA 12345-6789

MEMORANDUM FOR USTRANSCOM/TCJ4-MSS   17 Jun 97

FROM: UNIT/OFFICE SYMBOL

SUBJECT: Request for Access to the Global Transportation Network (GTN)

1. The following user requires access to GTN:

Name:	Doe, John A., JR
Rank:	MSgt (If civilian GS-#)
Service	USAF
MAJCOM:	ACC
Unit:	233 Transportation Sq.
Office Symbol:	LGXP
Street Address:	222 Wilson Ave
City/ST/Zip/APO/FPO:	Langley AFB, VA 12345-6789
E-Mail:	doejohn@233trans.langley.af.mil
Phone:	*DSN:* 234-5678 *Comm:* (555) 634-5678
FAX:	*DSN:* 234-5699 *Comm:* (555) 634-5699
Acct Type:	Unclassified GTN or Secret GTN
Clearance Type:	TS/SBI (Secret Account requests only)
Clearance Date:	01 Jan 95 (Secret accounts requests only)
Internet Browser:	Netscape 3.0, MS Internet Explorer 2.0, etc.

2. *(Enter single paragraph justification for access.)* MSgt Doe will be using GTN to monitor the flow of cargo through the aerial port at Langley AFB. He is properly cleared and has the need to know.

3. POC is Tsgt Ross DSN 576-0102. (Specify point of contact for senior officers/officials)

JANE W. SMITH
Colonel, USAF
Commander, 233 Trans. Squadron

(GTN Account Page, Web Document, 1998)

APPENDIX D - QUERY MENUS

1 What mode of travel are you interested in?

    Air   Ocean   Motor   Rail ● AnyMode

Passengers

How would you like your answers formatted?

● List answers grouped by Location

Summarize answer grouped by Location

Summarize all Locations

2 What should we use to find your passengers? You may look selections up.

Passenger Name [▾]

3 We can qualify the search by the values below. You may look qualifiers up.

NONE [▾]

4 What direction would you like to look?

Last Known Status, Date Constrained [▾]

7

8 [Submit] [Clear]

5 Where should we look? You may look locations up.

Worldwide [▾]   ☐ Channel

6 What date/time frame should we use? If you do not want to select date(s), use our calendar.

From: [Jan ▾] [8 ▾] [1999 ▾] [00:00] **To:** [Jan ▾] [8 ▾] [1999 ▾] [23:59]
Z   Z

<center>Passenger Query Menu</center>

---

1 What mode of travel are you interested in?

    ● Air   Ocean

Schedules

How would you like your answers formatted?

● List answers grouped by Location

Summarize answer grouped by Location

Summarize all Locations

2 What should we use to find your schedules? You may look selections up.

Mission Number [▾]

3 We can qualify the search by the values below. You may look qualifiers up.

NONE [▾]

4 What direction would you like to look?

Last Known Status, Date Constrained [▾]

7

8 [Submit] [Clear]

5 Where should we look? You may look locations up.

Worldwide [▾]   ☐ Channel

6 What date/time frame should we use? If you do not want to select date(s), use our calendar.

From: [Jan ▾] [8 ▾] [1999 ▾] [00:00] **To:** [Jan ▾] [8 ▾] [1999 ▾] [23:59]
Z   Z

<center>Schedule Query Menu</center>

1	What mode of travel are you interested in? Air Ocean Motor Rail ● AnyMode	**Unit Move**	How would your like your answers formatted? ● List answers grouped by Location
2	What should we use to find your unit? You may look selections up. Unit Identification Code [▼] = [_____]	**7**	
3	We can qualify the search by the values below. You may look qualifiers up. Unit Line Number [▼] [_____]		
4	What direction would you like to look? Arriving, Departing, or On Hand At [▼]	**8**	[Submit] [Clear]
5	Where should we look? You may look locations up. Seaport City Name [▼] ☐ Channel [____]	[____] [____] [____] [____] [____] [____]	
6	What date/time frame should we use? If you do not want to select date(s), use our calendar. **From:** [Jan ▼] [8 ▼] [1999 ▼] [00:00] **To:** [Jan ▼] [8 ▼] [1999 ▼] [23:59] **Z** **Z**		

Unit Query Menu

PORTS	Rail/Truck [▼]	DODAAC [▼]	[_____]
ASSETS	Containers [▼]	Container Type [▼]	[_____]
RATES	All Airlift Channel Rates (FY97) [▼]	MILAIR Code [▼]	[_____]
COMMODITY	National Motor Freight Class [▼]	Code [▼]	[_____]
AIRLIFT	Delivery Method [▼]	Code [▼]	[_____]
CARGO	Shipment Status [▼]	Code [▼]	[_____]
PASSENGERS	Type Travel [▼]	Code [▼]	[_____]
AIR REFUEL	A/R Delivery Mode [▼]	Code [▼]	[_____]
SHIPPING ACTIVITIES	UIC [▼]	Code [▼]	[_____]
SUPPLY	Requisition Status [▼]	Code [▼]	[_____]

Reference Query Menu

What mode of travel are you interested in?
1 Air   Ocean   Motor   Rail ● AnyMode   **Requisitions**

How would you like your answers formatted?
● List answers grouped by Location
Summarize answer grouped by Location
Summarize all Locations

2 What should we use to find your cargo? You may look selections up.
Requisition # [▼] = [   ]

7

3 We can qualify the search by the values below. You may look qualifiers up.
NONE [▼] = [   ]

4 What direction would you like to look?
Last Known S[▼]

8 [Submit] [Clear]

5 Where should we look? You may look locations up.
Worldwide [▼]   ☐ Channel [   ] [   ] [   ] [   ]

6 What date/time frame should we use? If you do not want to select date(s), use our calendar.
From: [Jan ▼] [8 ▼] [1999 ▼] [00:00] **To:** [Jan ▼] [8 ▼] [1999 ▼] [23:59]
Z   Z

Requisition Query Menu

What mode of travel are you interested in?
1 ● Air   **Asset**

How would you like your answers formatted?
● List answers grouped by Location
Summarize by Maintenance Status
Summarize by Mission Capability

2 What should we use to find your asset? You may look selections up.
Aircraft Tail Number [▼] = [   ]

7

3 We can qualify the search by the values below. You may look qualifiers up.
Aircraft Type [▼] = [   ]

4 What direction would you like to look?
Last Known Status, Date Constrained [▼]

8 [Submit] [Clear]

5 Where should we look? You may look locations up.
Worldwide [▼]   ☐ Channel [   ] [   ] [   ] [   ]

6 What date time frame should we use?
From: [Jan ▼] [8 ▼] [1999 ▼] [00:0] Z **To:** [Jan ▼] [8 ▼] [1999 ▼] [23:59] Z

Asset Query Menu

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APPENDIX E – GTN HOMEPAGE

Global Transportation Network

https://www.gtn.transcom.mil/webplus/indexbody.html

Global Transportation Network

If you are looking for your shipment in Defense Transportation System, click on Cargo.	If you have questions regarding the status of your order, click on Requisitions.
If you are trying to locate person(s) in the Defense Transportation System, click on Passengers.	If you are trying to locate where your units are in the Defense Transportation System, click on Unit Move.
If you have questions regarding Air Mobility Command airlift or air refueling, click on Schedules.	If you have any questions regarding any of the codes used in GTN, check these Reference tables.
If you are interested in other transportation related web sites, click on Transweb.	If you need transportation support from USTRANSCOM, click on Movement Requests.
If you need to request a GTN account, update an account, or download the client-server software, click on Accounts.	If you want to read the Message of the Day, click on Message.
If you wish to use an earlier version of the GTN WEB pages select Old Web.	If you need to find Resources in the GTN system systems, click on Resources.
If you need to find Assets in the GTN system, click on Assets.	

WARNING!!!

This is a Department of Defense (DoD) interest computer system. All DoD computer systems are subject to monitoring at all times to ensure proper functioning of equipment and systems, including security devices, to prevent unauthorized use and violations of statutes and security regulations, to deter criminal activity, and for other similar purposes. If monitoring of this or any other DoD computer system reveals possible evidence of violation of criminal statutes, this evidence and any other related information, including identification information about the user may be provided to law enforcement officials.

1 of 1

11/3/98 10:17 AM

(GTN Home Page, Web Page, 1998)

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APPENDIX F – AS OF DATA FIELD PAGE

https://www.gtn.transcom.mil/webplus/prot...%40p_hhmm%3D%220000%22&KEY=As_Of&VAL=0000

Question		
Response	**Query:**	as_of = 0000
	Run at:	1:08Z 24 Jan 99 for 0 secs
	Row Count:	25
	Locations:	*
	Download:	Excel Spreadsheet

```
Row YDDD HHMM ZuluRef Location (Standard Time)                        Location (Daylight Savi

1   8363 1200 Z-12    Rotuma Island/NFNR, Kwajalein/PKWA              Rotuma Island/NFNR, Kwa
2   8363 1300 Z-11    Pago Pago/NSTU, Sand Island/PMDY                Pago Pago/NSTU, Sand Is
3   8363 1400 Z-10    Hickam AFB/PHIK, Adak/PADK                      Hickam AFB/PHIK, Adak/P
4   8363 1500 Z-9     Elmendorf AFB/PAED, Eielson AFB/PAEI            Elmendorf AFB/PAED, Eie
5   8363 1600 Z-8     Travis AFB/KSUU, McChord AFB/KTCM
6   8363 1700 Z-7     Hill AFB/KHIF, Peterson Field/KCOS              Travis AFB/KSUU, McChor
7   8363 1800 Z-6     Kelly AFB/KSKF, Scott AFB/KBLV                  Hill AFB/KHIF, Peterson
8   8363 1900 Z-5     Dover AFB/KDOV, Charleston/KCHS                 Kelly AFB/KSKF, Scott A
9   8363 2000 Z-4     Roosevelt/TJNR, Thule/BGTL                      Dover AFB/KDOV, Charles
10  8363 2100 Z-3     Gander (-3.5)/CYQX, Malargue/SAMM               Roosevelt/TJNR, Thule/B
11  8363 2200 Z-2     -- Mid Atlantic --                              Gander (-2.5)/CYQX, Mal
12  8363 2300 Z-1     Lajes/LPLA, Amilcar/GVAC                        -- Mid Atlantic --
13  8364 0000 Z       Mildenhall/EGUN, Keflavik/BIKF                  Lajes/LPLA, Amilcar/GVA
14  8364 0100 Z+1     Ramstein/ETAR, Tuzla/LQTZ                       Mildenhall/EGUN, Keflav
15  8364 0200 Z+2     Adana/LTAG, Cairo Intl/HECA                     Ramstein/ETAR, Tuzla/LQ
16  8364 0300 Z+3     Bahrain/OBBI, Dhahran/OEDR                      Adana/LTAG, Cairo Intl/
17  8364 0400 Z+4     Fujairah/OMFJ, Ivanovo/RJOI                     Fujairah/OMFJ, Ivanovo/
18  8364 0500 Z+5     Indira Gahndi Intl/VIDP, Tashkent/UTTT Indira Gahndi Intl/VIDP
19  8364 0600 Z+6     Alma Ata/UAAA, Mingaladon/VYYY                  Alma Ata/UAAA, Mingalad
20  8364 0700 Z+7     Bangkok Intl/VTBD, Utapao/VTBU                  Bangkok Intl/VTBD, Utap
21  8364 0800 Z+8     Paya Lebar/WSAP, ·Hong Kong Intl/VHHH Paya Lebar/WSAP, Hong K
22  8364 0900 Z+9     Kadena/RODN, Yokota/RJTY                        Kadena/RODN, Yokota/RJT
23  8364 1000 Z+10    Anderson/PGUA, Richmond/YSRI                    Anderson/PGUA, Richmond
24  8364 1100 Z+11    Kosrae/PTSA, Pohnpei/PTPN                       Kosrae/PTSA, Pohnpei/PT
25  8364 1200 Z+12    Christ Church Intl/NZCH                         Christ Church Intl (+13
```

END OF DATA

1/23/99 5:04 PM

APPENDIX G – TCN DATA PAGE

Carrier	ETA Date ATA Date Code	Location ETD Date ATD Date GBL or M RF Tag #	
		--- Requisition Status --	
	12008342 491200	JACKSONVILLE, FLORIDA	FILL
	0000 8342 1200 8342 491200	JACKSONVILLE, FLORIDA	RLSID
	00008364	(UNKNOWN PLACE}	REC
		--- Booking Status --	
		--- Movement to POE --	
	LICZ	SIGONELLA NAS, ITALY	ARRIVE
		--- Onhand Status ---	
	00008342 491200	JACKSONVILLE, FLORIDA	REC
	00008342 216677	MECHANICSBURG, PENNSYLVANIA	REC
	0200 8344 KNGU	NORFOLK, VIRGINIA	PRO
	0200 8344 KNGU	NORFOLK, VIRGINIA	PLT
	0200 8344 KNGU	NORFOLK, VIRGINIA	PLP
	2000 8346 LICZ	SIGONELLA NAS, ITALY	PRO
	2000 8346 LICZ	SIGONELLA NAS, ITALY	ARP
	2000 8346 LICZ	SIGONELLA NAS, ITALY	PLP
	2100 9005 KNGU	NORFOLK, VIRGINIA	PRO
	2100 9005 KNGU	NORFOLK, VIRGINIA	ARP
	2100 9005 KNGU	NORFOLK, VIRGINIA	LDP
	2100 9005 KNGU	NORFOLK, VIRGINIA	MNL
		--- Schedule/Leg Movement --	
	KNGU	NORFOL 0735 8346 0845 8346 NGUGY00743	DEPART
	1400 8346 1455 8346 LERT	ROTA, SP 1720 8346 1733 8346	DEPART
	1945 8346 2006 8346 LICZ	SIGONELLA NAS, ITALY	ARRIVE
	LICZ	SIGONEL 1805 8364 1155 9004 SIZCJ01209	DEPART
	2045 8364 1456 9004 LERT	ROTA, SP 2235 8364 1724 9004	DEPART
	0615 8365 0150 9005 KNGU	NORFOLK, VIRGINIA	ARRIVE
FDEX	KNGU	NORFOLK, VIRGINI 1900 9011 NGUN53921 0	DEPART
	KXXX	UNLISTED STATION	ARRIVE
		--- Other Movement Events ---	

Units	NSN or Pa LIN# Cube	Spcl Hndl Um Move Wgt		Hgt	Lngth	Wdth	
EAC	6.11E+12	z					39

APPENDIX H – TIME REFERENCE PAGE

Response	Run at:	1:08Z 24 Jan 99 for [0] secs
	Row Count:	25
	Locations:	*
	Download:	Excel Spreadsheet

Row	YDDD	HHMM	ZuluRef	Location (Standard Time)	Location (Daylight Savi
1	8363	1200	Z-12	Rotuma Island/NFNR, Kwajalein/PKWA	Rotuma Island/NFNR, Kwa
2	8363	1300	Z-11	Pago Pago/NSTU, Sand Island/PMDY	Pago Pago/NSTU, Sand Is
3	8363	1400	Z-10	Hickam AFB/PHIK, Adak/PADK	Hickam AFB/PHIK, Adak/P
4	8363	1500	Z-9	Elmendorf AFB/PAED, Eielson AFB/PAEI	Elmendorf AFB/PAED, Eie
5	8363	1600	Z-8	Travis AFB/KSUU, McChord AFB/KTCM	
6	8363	1700	Z-7	Hill AFB/KHIF, Peterson Field/KCOS	Travis AFB/KSUU, McChor
7	8363	1800	Z-6	Kelly AFB/KSKF, Scott AFB/KBLV	Hill AFB/KHIF, Peterson
8	8363	1900	Z-5	Dover AFB/KDOV, Charleston/KCHS	Kelly AFB/KSKF, Scott A
9	8363	2000	Z-4	Roosevelt/TJNR, Thule/BGTL	Dover AFB/KDOV, Charles
10	8363	2100	Z-3	Gander (-3.5)/CYQX, Malargue/SAMM	Roosevelt/TJNR, Thule/B
11	8363	2200	Z-2	-- Mid Atlantic --	Gander (-2.5)/CYQX, Mal
12	8363	2300	Z-1	Lajes/LPLA, Amilcar/GVAC	-- Mid Atlantic --
13	8364	0000	Z	Mildenhall/EGUN, Keflavik/BIKF	Lajes/LPLA, Amilcar/GVA
14	8364	0100	Z+1	Ramstein/ETAR, Tuzla/LQTZ	Mildenhall/EGUN, Keflav
15	8364	0200	Z+2	Adana/LTAG, Cairo Intl/HECA	Ramstein/ETAR, Tuzla/LQ
16	8364	0300	Z+3	·Bahrain/OBBI, Dhahran/OEDR	Adana/LTAG, Cairo Intl/
17	8364	0400	Z+4	Fujairah/OMFJ, Ivanovo/RJOI	Fujairah/OMFJ, Ivanovo/
18	8364	0500	Z+5	Indira Gahndi Intl/VIDP, Tashkent/UTTT	Indira Gahndi Intl/VIDP
19	8364	0600	Z+6	Alma Ata/UAAA, Mingaladon/VYYY	Alma Ata/UAAA, Mingalad
20	8364	0700	Z+7	Bangkok Intl/VTBD, Utapao/VTBU	Bangkok Intl/VTBD, Utap
21	8364	0800	Z+8	Paya Lebar/WSAP, Hong Kong Intl/VHHH	Paya Lebar/WSAP, Hong K
22	8364	0900	Z+9	Kadena/RODN, Yokota/RJTY	Kadena/RODN, Yokota/RJT
23	8364	1000	Z+10	Anderson/PGUA, Richmond/YSRI	Anderson/PGUA, Richmond
24	8364	1100	Z+11	Kosrae/PTSA, Pohnpei/PTPN	Kosrae/PTSA, Pohnpei/PT
25	8364	1200	Z+12	Christ Church Intl/NZCH	Christ Church Intl (+13

Time Reference Page for the USS CARR's Fire Pump Motor

Question	Query:	as_of = 0000
Response	Run at:	2:28Z 26 Jan 99 for [1] secs
	Row Count:	25
	Locations:	*
	Download:	Excel Spreadsheet

```
Row YDDD HHMM ZuluRef  Location (Standard Time)                 Location (Daylight Savi

1   8352 1200 Z-12     Rotuma Island/NFNR, Kwajalein/PKWA       Rotuma Island/NFNR, Kwa
2   8352 1300 Z-11     Pago Pago/NSTU, Sand Island/PMDY         Pago Pago/NSTU, Sand Is
3   8352 1400 Z-10     Hickam AFB/PHIK, Adak/PADK               Hickam AFB/PHIK, Adak/P
4   8352 1500 Z-9      Elmendorf AFB/PAED, Eielson AFB/PAEI     Elmendorf AFB/PAED, Eie
5   8352 1600 Z-8      Travis AFB/KSUU, McChord AFB/KTCM
6   8352 1700 Z-7      Hill AFB/KHIF, Peterson Field/KCOS       Travis AFB/KSUU, McChor
7   8352 1800 Z-6      Kelly AFB/KSKF, Scott AFB/KBLV           Hill AFB/KHIF, Peterson
8   8352 1900 Z-5      Dover AFB/KDOV, Charleston/KCHS          Kelly AFB/KSKF, Scott A
9   8352 2000 Z-4      Roosevelt/TJNR, Thule/BGTL               Dover AFB/KDOV, Charles
10  8352 2100 Z-3      Gander (-3.5)/CYQX, Malargue/SAMM        Roosevelt/TJNR, Thule/B
11  8352 2200 Z-2      -- Mid Atlantic --                       Gander (-2.5)/CYQX, Mal
12  8352 2300 Z-1      Lajes/LPLA, Amilcar/GVAC                 -- Mid Atlantic --
13  8353 0000 Z        Mildenhall/EGUN, Keflavik/BIKF           Lajes/LPLA, Amilcar/GVA
14  8353 0100 Z+1      Ramstein/ETAR, Tuzla/LQTZ                Mildenhall/EGUN, Keflav
15  8353 0200 Z+2      Adana/LTAG, Cairo Intl/HECA              Ramstein/ETAR, Tuzla/LQ
16  8353 0300 Z+3      Bahrain/OBBI, Dhahran/OEDR               Adana/LTAG, Cairo Intl/
17  8353 0400 Z+4      Fujairah/OMFJ, Ivanovo/RJOI              Fujairah/OMFJ, Ivanovo/
18  8353 0500 Z+5      Indira Gahndi Intl/VIDP, Tashkent/UTTT   Indira Gahndi Intl/VIDP
19  8353 0600 Z+6      Alma Ata/UAAA, Mingaladon/VYYY           Alma Ata/UAAA, Mingalad
20  8353 0700 Z+7      Bangkok Intl/VTBD, Utapao/VTBU           Bangkok Intl/VTBD, Utap
21  8353 0800 Z+8      Paya Lebar/WSAP, Hong Kong Intl/VHHH     Paya Lebar/WSAP, Hong K
22  8353 0900 Z+9      Kadena/RODN, Yokota/RJTY                 Kadena/RODN, Yokota/RJT
23  8353 1000 Z+10     Anderson/PGUA, Richmond/YSRI             Anderson/PGUA, Richmond
24  8353 1100 Z+11     Kosrae/PTSA, Pohnpei/PTPN                Kosrae/PTSA, Pohnpei/PT
25  8353 1200 Z+12     Christ Church Intl/NZCH                  Christ Church Intl (+13
```

Time Reference Page for the USS CARR's Relay

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APPENDIX I – FEDEX TRACKING PAGES

FedEx United States

- Registration
- Shipping
- Tracking
- Dropoff Locator
- Rate Finder

- Service Info
- eBusiness Tools
- About FedEx
- Index|Search
- Contact Us

Home

Tracking ▸How to

New! Now you can track FedEx, RPS, and Viking shipments from our Advanced Tracking page.

Select Destination Country

UNITED STATES
ALBANIA
ALGERIA
AMERICAN SAMOA
ANDORRA

Airbill Tracking Number

Ship Date (+/- 4 days)

MMDDYY

▸ Request Tracking Info

Please complete the fields above and click the Request Tracking Info button to track your package.

Click Below For Information On:

- Email Tracking
- FedEx Money-Back Guarantee
- Advanced Tracking

FedEx interNetShip®

Try the new and improved FedEx interNetShip® version 4.0 and expedite all your shipping needs. You can prepare Air Waybills and request a pickup without the need for any additional software, and ship from the U.S. to over 160 countries worldwide.

You can also create your own Address Book and save up to 75 names and addresses for faster processing. And with FedEx Ship Alert^{SM} you may now include your own personal greeting when you notify recipients via email. With FedEx interNetShip, you receive the services and information you need to speed the processing of your shipments.
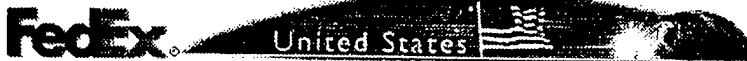
(FedEx Tracking Page, Web Page, 1999)

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FedEx. United States

Results

Airbill Number : 420554060300

- Delivered To : Recept/Frnt desk

- Delivery Location : PITTSBURGH PA

- Delivery Date : 01/28

- Delivery Time : 10:08

- Signed For By : V.HOMITSKY

- Scan Activity :

    - Delivered PITTSBURGH PA 01/28 10:08

    - Arrived at Destination PITTSBURGH PA 01/28 07:31

    - Package Left Hub MEMPHIS TN 01/28 03:28

    - Package Left Hub MEMPHIS TN 01/28 02:04

    - Package left FedEx Ramp SAN JOSE CA 01/27 19:19

    - Left Origin Location MONTEREY CA 01/27 16:09

    - Left Origin Location MONTEREY CA 01/27 17:06

    - Left Origin Location MONTEREY CA 01/27 16:58

    - Picked up MONTEREY CA 01/27 14:43

If you have any questions about your shipment, please send us
e-mail or contact Customer Service.

1 of 1　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　1/28/99 8:26 PM

(FedEx Results 1, Web Page, 1999)

Navigation sidebar:
- Registration
- Shipping
- Tracking
- Dropoff Locator
- Rate Finder
- Service Info
- eBusiness Tools
- About FedEx
- Index|Search
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- Home

FedEx   United States

Results

Airbill Number : 811235729442

- **Delivered To :**

- **Delivery Location :**

- **Delivery Date :**

- **Delivery Time :**

- **Signed For By :**

- **Status Exception : Payment Received**

- **Scan Activity :**

    - **Arrived at Destination CONCORD NC 01/27 07:23**

    - **Package left FedEx Ramp CHARLOTTE NC 01/27 05:33**

    - **Package Left Hub MEMPHIS TN 01/27 01:55**

    - **Package Arrived at FedEx Ramp CHARLOTTE NC 01/27 05:31**

    - **Package Left Hub MEMPHIS TN 01/27 01:38**

    - **Left Origin Location ATHENS GA 01/26 19:14**

    - **Pickup Exception ATHENS GA 01/26 16:40**

If you have any questions about your shipment, please send us
e-mail or contact Customer Service.

(FedEx Results 2, Web Page, 1999)

FedEx United States

Tracking ▸ How to

Service Focus
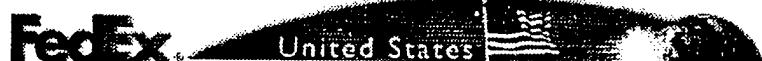
Tracking Type

[FedEx Package Tracking Number ▼]

Tracking Number

[_____]

Account Number/Shipper ID

[_____]

(not required for Viking)

◉ Request Tracking Info

Advanced Tracking allows you to locate your FedEx, RPS, or Viking shipments easily by selecting the tracking type, entering your Tracking Number, and corresponding Account Number/Shipper ID (not required for Viking). Complete the fields above and click the Request Tracking Info button to track your shipment.

For FedEx packages, if you do not know your FedEx Account Number or if you paid by cash or credit card, you can use Standard Tracking to track your package.

If you would like to open a FedEx account, click here.

Click Below For Information On:

- Email Tracking
- FedEx Money-Back Guarantee

Missed the last pickup? Find a drop-off location near you with FedEx's convenient Dropoff Locator. You can search for package drop-off locations in the U.S. by ZIP code or by city and state, and view a map of the drop-off location online. With over 40,000 convenient locations to choose from, including many Kinkos®, OfficeMax® and Staples® stores, there is sure to be a location near you. Next time you ship a package, use the Dropoff Locator to find a drop-off location instantly.

Navigation menu:
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(FedEx Advance Tracking Page, Web Page, 1999)

APPENDIX J – SURVEY QUESTIONS

Part I.

QUESTIONS

1. Have you heard of GTN (if no, go to **Part II**)? (Type an "X" next to the applicable response)
Yes:
No:

2. How did you find out about it?

3. Do you know what GTN is? (Type an "X" next to the applicable response)
Yes:
No:

4. Do you know what GTN can be used for? (Type an "X" next to the applicable response)
Yes:
No:

5. Have you used or do you currently use GTN? (Type an "X" next to the applicable response)
Yes:
No:
Don't Know:

6. If yes, how did you learn to use it? (For example, GTN user course or self instruction)

7. Do you use GTN to track supplies, services or other types of shipments? (Type an "X" next to the applicable response)
Yes:
No:

8. To what extent do your seniors know of GTN? (Type an "X" next to the applicable response)
Great:
Average:
Little:
None:
Don't Know

9. To what extent are you supported by your command to use GTN? (Type an "X" next to the applicable response)
Greatly:
Average:
Little:
Don't Know:

10. Have you used the system's "Feedback" form to get help? (Type an "X" next to the applicable response)
Yes:
No:

11. If you answered "yes" to question 10, how long did it take you to receive a response? (Type an "X" next to the applicable response)
Less than a day:
One day:
Two to five days:
More than a week:
Never got a response:

12. If you answered yes to question 9, did you receive a timely response? (Type an "X" next to the applicable response)
Yes:
No:

13. To what extent did GTN create more problems? (Type an "X" next to the applicable response)
Greatly:
Little:
None:

14. To what extent did GTN create extra work? (Type an "X" next to the applicable response)
Greatly:
Little:
None:

15. To what extent do you like using GTN? (Type an "X" next to the applicable response)
Greatly:
Average:
Little:
Don't Care:
Don't Know:

16. Is there anything more you would like to see it do?

Part II.

What is GTN?

The Global Transportation Network (GTN) is an integrated database system that provides users with "real-time" in-transit visibility information and command and control capabilities to facilitate transportation planning and decision making during all types of operations. GTN is a Web based system that allows users to conduct queries to obtain real time status about their shipments whether it is cargo, passenger, or parts. Conducting queries are simple--all you need to do is enter the National Stock Number, Requisition Number, Transportation Control Number, RF Tag ID, or Transponder ID if known.

QUESTION

1. Now knowing the basic capability of GTN, would you use it? (Type an "X" next to the applicable response)
Yes:
No:

2. If you answered "no" to question 1, why you would not use GTN? (Type an "X" next to the applicable response)
No Interest:
Too much work:
The system or method I use is just as good:

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FedEx Results 2 Page < http://www.fedex.com/cgi-bin/track_it?des...cking+Info.x=55&Request+Tracking+Info.y=7> 28 January 1999.

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